Determination: Soil contamination, USTs

PA/VSI Or RFA FILE REVIEW CHECKLIST

Facility Name: GMC (Milford Proving Grounds)

EPA ID: MID 082 220 757___ City: 3300 General Motors Rd Milford, Oakland__ State: MI_

Name of Reviewer: Maureen McHugh_____ Date of Review: 8/14/08_____

1	Yes	No	Is this a one folder site?
2	Yes	No	Are there Superfund files for this site?
3	Yes	No	Did you Read the Executive Summary?
			There are: _48___ SWMUs and _____ AOCs at this site.
4	Yes	No	Did you review the regulatory history?
5	Yes	No	Does the facility have interim status or a permit?
			This facility is a: ____ SQG, _____ LQG, or ____ Less than 90 day.
6	Yes	No	Was the Facility closed per RCRA? RCRAInfo 380 (1993)
			If Yes, was the closure: __X__ CC, or _____ CIP.
7	Yes	No	Are there documented (historical) releases? Briefly describe on Page 2.
8	Yes	No	Were there releases identified during the inspection? Briefly describe on Page 2.
9	Yes	No	Do you agree with the Conclusions and Recommendations?
			If No, briefly describe on Page 2.

As a result of your review of the PA/VSI or RFA file, please classify this site as:

_____ No further corrective action recommended or warranted: These are sites that closed the regulated units and any other SWMUs or AOCs at the site did not warrant any further corrective action (no historic releases or evidence of releases observed during the Visual Site Inspection).

___X__Further Action Required: Soil or sediment sampling or groundwater sampling or monitoring or any type of investigation that was recommended in the report in response to a documented or observed release at any SWMU or AOC and where such investigation, whether being addressed during the inspection or after, does not have the necessary documentation in the facility record files.

_____ More Information Needed: There is no RFA, PA/VSI or RCRA closure information available.

PA/VSI Or RFA FILE REVIEW CHECKLIST

Notes

7 hazardous waste USTs (SWMU21-27) were removed in 1987. The tanks were never tested for leaks and the adjacent soils and groundwater were never tested for residual contamination.

Briefly describe any documented (historical) releases for any SWMU or AOC recorded in the report. For each release, please identify the SWMU or AOC and a one or two line description of release.

There was a small leak of petroleum distillates from UST#38 (site 20) in1987. The contaminated soil was disposed of and groundwater monitoring wells were installed. A hydrological study was done for this area and it concluded that remedial actions were complete.
There was a small leak of chlorinated solvents, paint, paint thinners, and mineral spirits from UST#145 (SWMU33) in 1982. 2-3 drums of contaminated soil were removed.

Briefly describe any releases observed during the inspection for any SWMU or AOC recorded in the report. For each release, please identify the SWMU or AOC and a one or two line description of release.

PA/VSI Recommendations
Hydrogeologic study of SWMU1, the vegetation landfill, SWMU2, the inert material landfill, and SWMU3, the closed landfill.
Soil and groundwater sampling at SWMU33 (UST #145) because no sampling was done at the time of removal.
Soil and groundwater sampling at SWMU21-27 (UST#122A, 123, 124, 125, 127, 127A, 133)
Integrity testing at SWMU19, 30, 34 (UST#93, 136, 150)

Looked up in MI UST database ID#00016461. Over 200 USTs. Some have been removed from the ground, some closed in place, and some are currently in use. 12 LUST incidents closed in the 1990s and 12 open LUST incidents.

GM Milford Proving Ground
Current Product Engineering
General Motors Corporation

January 23, 1989

U.S. EPA
Region 5
230 South Dearborn Street
Chicago, IL 60604

Attention Mr. David Petrovski, RCRA Permitting Branch

Gentlemen:

RCRA Facility Assessment
GMC - Milford Proving Ground
MID 082 220 757
Visual Site Inspection (VSI)

Please find attached the revised listing of the solid waste management units (SWMUs). A typing error was discovered in the units used for the amount of waste disposed in SWMU No. 3. The correct amount is 18-20 cu. ft. (not cu. yd.) as noted in the attached 1981 EPA notification.

Sincerely,

Carole G. Everett

Carole G. Everett
Sr. Environmental Engineer
Plant Engineering Department

nw
Attachment
Certified
cc: Ronda Hall, Michigan Department of Natural Resources
Jerome Meyer, Livingston County Health Department

Attachment 1
Question 2

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
1.	Landfill	Vegetation landfill covering 1/2 acre. Natural hole. Remaining capacity is 5-9 yrs.	Dead trees, prunings, shipping crates. No hazardous waste or constituents.	200 cu.yd. /yr.	1960 - present
2.	Landfill	Inert Material landfill. Covers 1 acre. Natural hole. Remaining capacity 1-2 years.	Broken concrete, brick, masonry, pavement, uncontaminated soil. No hazardous wastes or constituents.	2000 cu. yd. /yr.	1969 - present
3.	Landfill	Closed landfill - covers 7500 sq. ft. Last used in 1973.	Only known waste was pesticides.	18-20 cu. ft.	? - 1973
4.	Surface Impoundment	Seepage pond - covers 9600 sq. ft. and is 1 ft. deep. Referred to as Outfall 003 under our NPDES Permit. Storm watershed.	Non-hazardous waste - wastewater and storm water runoff.	2-3 mgal /yr	1951 - present
5.	Surface Impoundment	Mott "Lake" - covers 8 acres and is 4 ft. deep. Has an inlet and outlet. Storm watershed.	Non-hazardous waste - wastewater from Outfall 001 and storm water run-off flow through the the unit into Mann Creek.	62-84 mgal /yr - Known flows from 1978 to present	1924 - present
6.	Surface Impoundment	Pickett "Lake" - covers 500,000 sq. ft. and is 7.5 ft. deep. Storm watershed.	Storm water run-off.	25-35 mgal /yr.	1951 - present
7.	Land Farm	15 acre field located by the northwest end of the Military Straightaway. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	7 cu. yds. 16.4 cu. yds. 18 cu. yds.	6/26/87 4/12/88 6/16/88

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
8.	Land Farm	4.5 mile strip of land around the Circular Test Track covering about 70 acres. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	9.7 cu. yd. 7 cu. yd. 40 cu. yd. 35 cu. yd.	3/24/87 7/31/87 11/18/87 8/5/88
9.	Land Farm	14 acre field inside the Truck Test Loop. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	100 cu. yd. /yr.	1978 - 1983
10.	Waste Pile	20425 sq. ft. fenced-in storage area south of Bldg 73A. 50% of area is paved.	Compacted cars which have been drained of fluids, and metal car parts.	N.A.	1976 to present
11.	Waste Pile	86175 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped cars and metal car parts.	N.A.	1966 - 1976
12.	Waste Pile	2080 sq. ft. fenced-in storage area north of Bldg 86.	Scrapped tires.	N.A.	1986 to present
13.	Waste Pile	3500 Sq. Ft. Fenced-in storage area south of Bldg 73A.	Scrapped tires.	N.A.	1976 - 1986
14.	Waste Pile	900 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped tires.	N.A.	1966 - 1976
15.	Waste Pile	150 sq. ft. concrete storage area next to the old Butler Bldg under Water Tower #2	Scrapped lead acid batteries	N.A.	1960 - 1988

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
16.	Incinerator	Located in Bldg 18	Rubbish - paper prod.	N.A.	1954 - 1973
17.	Above ground tank	(2) 10 gal capacity stainless steel tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - F001	N.A.	1981 - present
18.	Above ground tank	30 gal capacity polyethylene tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - D002	N.A.	1981 - present
19.	Underground tank	Tank #93 - 11,730 gal. capacity fiberglass tank at Bldg 43. 90 day accumulation. (abandoned 1988)	Hazardous waste - D001, gasoline	N.A.	1985 - 1987
20.	Underground tank	Tank #38 - 3,000 gal. capacity steel tank at Bldg 42A. 90 day accumulation. (removed 12/10/87)	Hazardous waste - D001, gasoline	N.A.	1987
21.	Underground tank	Tank #122A - 4,000 gal. capacity steel tank at Bldg 12. 90 day accumulation. (removed 1988)	Hazardous waste - engine oil, contaminated with F001	N.A.	1974 - 1988
22.	Underground tank	Tank #123 - 1,000 gal. capacity steel tank at Bldg 26. 90 day accumulation. (removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1966 - 1987
23.	Underground tank	Tank #124 - 1,000 gal. capacity steel tank at Bldg 27. 90 day accumulation. (Abandoned 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1967 - 1987
	Underground tank	Tank #125 - 1,000 gal. capacity steel tank at Bldg 32. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1972 - 1987

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
25.	Underground tank	Tank #127 - 6,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
26.	Underground tank	Tank #127A - 10,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
27.	Underground tank	Tank #133 - 500 gal. capacity steel tank at Bldg 31. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1978 - 1987
28.	Underground tank	Tank #137 - 1,500 gal. capacity steel tank at Bldg 70. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1981 to present
29.	Underground tank	Tank #138 - 4,000 gal. capacity steel tank at Bldg 78. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1985 to present
30.	Underground tank	Tank #136 - 1,500 gal. capacity steel tank at Bldg 24.	Non-hazardous waste - hydraulic oil	N.A.	1981 to present
31.	Underground tank	Tank #226 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - gasoline and petroleum distillates, D001.	N.A.	1/88 to present
32.	Underground tank	Tank #227 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - oil contaminated with F001	N.A.	1/88 to present
33.	Underground tank	Tank #145 - 4,000 gal. fiberglass tank at Bldg 42D. (removed in 1982)	Hazardous waste - chlorinated solvents, paint & thinners, mineral spirits. F001, F003, F005, D001.	N.A.	1974 - 1980

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
34.	Underground tank	Tank # 150 - 12,000 gal. steel tank at Bldg 42A.	Non-Hazardous process water.	N.A.	1981 to present
35.	Container storage area	6 ft. x 25 ft. covered concrete area for storage of approximately 20 (55) gallon drums of waste located at Bldg 19. Containment provided.	Hazardous waste - chlorinated solvents, paints, paint thinners, mineral spirits, paint solids, adhesives.	N.A.	1981 to present
36.	Container storage area	a 4 ft. x 6 ft. pallet in a 10 ft. x 14 ft. masonry building (Bldg 39) used for storage.	Hazardous waste - depleted lithium batteries (D003), waste.	N.A.	1982 to present
37.	Container Storage area	A 10 ft. x 10 ft. curbed-in concrete storage area in Reynolds Barn. 270 day accumulation.	PCB contaminated hydraulic oil, rags & gloves; capacitors & lighting ballasts.	N.A.	1981 to present
38.	Container storage area	A 10,000 sq. ft. paved area located by the barrel storage area north of Bldg 11.	Empty barrels once filled with hazardous or non-hazardous materials.	N.A.	1974 to present
39.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1974 to present
40.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1983 to present

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
41.	Wastewater Treatment Unit	Imhoff tank located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water.	N.A.	1943 - 1974
42.	Other - in ground tank	Concrete storage or surge tank for the wastewater treatment units having the capacity of 160,000 gal located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1974 to present
43.	Other - in ground tank	Concrete accumulation tank at Bldg 31. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1970 to present
44.	Other - in ground tank	Concrete accumulation tank at Bldg 70. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1981 to present
45.	Other - in ground tank	Concrete accumulation tank at Bldg 40. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1979 to present

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
46.	Other - sludge drying beds	Two side-by-side concrete units covering 12,000 sq. ft. & having a total capacity of 64,000 gal located by Bldg 19. Equipped with a seepage collection system. Seepage pumped into wastewater storage tank.	Non-hazardous sludge from aerobic digester of wastewater treatment units.	N.A.	1986 to present
47.	Other - sludge drying beds	12,000 sq. ft. graveled area located by Bldg 19.	Non-hazardous sludge from aerobic digester of wastewater treatment unit.	N.A.	1974 - 1986
48.	Container storage area	29 ft x 20 ft paved area covered by a 3 sided building structure north of Bldg 11.	Non-hazardous waste - Scrapped lead-acid batteries. Unit also serves as a drop-off area for waste chemical materials generated on site.	N.A.	Sept. 1988 to present

Attachment II

Question 3

SITE NUMBER & DESCRIPTION	DATE OF RELEASE	TYPE OF WASTE RELEASED	QUANTITY RELEASED	DESCRIPTION OF RELEASE
Site #20 - underground tank #38.	12/04/87 date detected	Petroleum distillates	Quantity unknown, believed to be small. Investigation on-going.	Leak from tank piping system at the tank site.
Site #33 - underground tank #145.	Nov. 1982 date detected	Chlorinated solvents, paint & paint thinners, mineral spirits.	Quantity unknown, believed to be small.	Leak from a small hole in bottom of tank.

EPA Notification of Hazardous Waste Site

United States
Environmental Protection
Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: General Motors Proving Ground
Street: Hickory Ridge Road
City: Milford State: MI Zip Code: 48042

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: same
Street:
City: County: State: Zip Code:

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Leitz, H. P., Mgr. - Facility Services
Phone: 313-685-5180

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1973 To (Year): One Time Disposal

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☒ Inorganics
3. ☐ Solvents
4. ☒ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☒ Other (Specify)

Outdated chemicals

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

Form Approved
OMB No. 2000-0138

Notification of Hazardous Waste Site — Side Two

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☒ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet 18-20

gallons _____

Total Facility Area

square feet 150

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☒ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required

Name Kelly. A. H.

General Motors Proving Ground

Street Hickory Ridge Road

City Milford State MI Zip Code 48042

Signature _____ Date June 1, 1981

☒ Owner
☒ Owner, [illegible]
☐ Transporter
☐ Operator, Preser
☒ Operator, Past
☐ Other

EXECUTIVE CORRESPONDENCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

APR 07 1989

5HR-13

Kenneth J. Burda, Chief
Hazardous Waste Permits Section
Waste Management Division
Michigan Department of Natural
Resources
P.O. Box 30028
Lansing, Michigan 48909

Dear Mr. Burda:

Enclosed for review is a copy of the RCRA Facility Assessment (RFA) for the G.M. facility in Milford, Michigan.

If you have any comments, please contact Mr. Dave Petrovski at (312) 886-0997.

Sincerely,

Richard Traub

Richard Traub, Chief
Michigan Permitting Section

Enclosure

cc: Carole Everett, G.M.

APR 0 7 1989

5HR-13

Kenneth J. Burda, Chief
Hazardous Waste Permits Section
Waste Management Division
Michigan Department of Natural
Resources
P.O. Box 30028
Lansing, Michigan 48909

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If you have any comments, please contact Mr. Dave Petrovski at (312) 886-0997.

Sincerely,

ORIGINAL SIGNED BY/
RICHARD TRAUB
Richard Traub, Chief
Michigan Permitting Section

Enclosure

cc: Carole Everett, G.M.

5HR:PETROVSKI:fmd:4-5-89 Computer Disc #1:B:GM.LTR

RCRA PERMITS	TYP.	AUTH.	IL. CHIEF	IN. CHIEF	MI. CHIEF	MN/WI CHIEF	OH. CHIEF	RPB CHIEF	O.R. A.D.D.	WMD DIR
INIT. DATE	4/7/89	4/7/89			4/7/89					

GM Milford Proving Ground
Current Product Engineering
General Motors Corporation

December 6, 1988

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

U.S. EPA
Region 5
230 South Dearborn Street
Chicago, IL 60604

Attention: Mr. David Petrovski
RCRA Permitting Branch

RE: RCRA Facility Assessment
GMC Milford Proving Ground
MID 082 220 757
Visual Site Inspection (VSI)

Dear Mr. Petrovski:

During your site inspection at the GM Proving Ground on November 16, 1988, you requested additional information. The photographs taken of the Solid Waste Management Units (SWMU's) during your visit have been developed by the Proving Ground's Audio Visual Department and are enclosed. Please note that the 5 gallon containers in the photograph of SWMU No. 36 are empty.

In addition, please find the following requested information:

-Updated listing of SWMUs and location map
-Guidance for tank removals used by the Proving Ground
-Notification to EPA in 1981 concerning SWMU No. 3

The report regarding SWMU No. 20 (tank #38) will be submitted to your office as soon as it is finalized (2 to 3 weeks).

If you need additional information, please contact me at (313) 685-6435.

Sincerely,

Carole G. Everett
Carole G. Everett
Sr. Environmental Engineer
Plant Engineering Department

jl

Attachments

David B.

NOV 1 0 1988

5HR-13

Ms. Carol Everett
Senior Environmental Engineer
3300 General Motors Road
Milford, Michigan 48042

Re: RCRA Facility Assessment
GMC Milford Proving Ground
MID 082 220 757

Dear Ms. Everett:

The Hazardous and Solid Waste Amendments of 1984 (HSWA) to the Resource Conservation and Recovery Act (RCRA) contain provisions that the State of Michigan is not authorized to implement pursuant to Act 64. A Federal HSWA Permit must be prepared for your facility and will be issued concurrent with the Act 64 Operating License. The RCRA Facility Assessment (RFA) constitutes the first step in the HSWA permitting process. The RFA includes a Preliminary Review (PR) of available file information, a Visual Site Inspection (VSI) of the facility, and if necessary, a Sampling Visit (SV).

As has been discussed in a recent telephone conversation with a member of my staff, a VSI of your facility will be conducted on Wednesday, November 16, 1988. The purpose of the VSI is to fill in data gaps identified in the PR; confirm information in the Solid Waste Management Unit (SWMU) certification letter dated August 31, 1988; visually inspect the entire facility for evidence regarding releases of hazardous waste or hazardous constituents; and focus recommendations concerning the need for further action at the facility. In addition, photographs will be taken at all SWMUs and any areas of concern.

Should you have further questions regarding this matter, please contact Mr. David Petrovski, at (312) 996-0997.

Sincerely,

ORIGINAL SIGNED BY/
HAK K. CHO

Karl E. Bremer, Chief
RCRA Permitting Branch

cc: Ken Burda, MDNR

bcc: D. Petrovski
R. Traub
File

5HR-13:PETROVSKI:js:6/6161:11/8/88:pc Disk:B:Everett

STATE OF MICHIGAN

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

RONALD O. SKOOG, Director

S.E. Michigan Field Office
15500 Sheldon Road
Northville, MI 48167

January 23, 1985

MIDO82220 757

GMC Proving Ground - Milford
Hickory Ridge & GM Roads
Milford, Michigan

Gentlemen:

As part of our FY85 Hazardous Waste Management Cooperative Agreement with the U.S. EPA, we are obligated to review the adequacy of the closure and post-closure plans for all hazardous waste treatment storage and disposal facilities (TSDFs) in the state.

Your facility falls under this classification. Therefore, please submit two up-to-date copies of your closure plan for your treatment, storage, and disposal facility by February 15, 1985.

[illegible] following address:

Hazardous Waste Division
Michigan Department of Natural Resources
15500 Sheldon Road
Northville, MI 48167

If you have any questions regarding this letter, please contact me at (313) 459-9180.

Sincerely,

Benedict N. Okwumabua, PhD.
District Supervisor
Hazardous Waste Division

cc: U.S. EPA
J. Bohunsky
A. Howard

RCRA Facility Assessment (RFA)
Preliminary Review/Visual Site Inspection
PR/VSI Report
For
GMC - Milford Proving Ground
Milford, Michigan
MID 082 220 757

Prepared by
David Petrovski
Geologist
United States Environmental Protection Agency
Region V
230 South Dearborn
Chicago, IL 60604

I. RCRA Facility Assessment (RFA) Synopsis

A. Purpose

The RCRA Corrective Action authorities were established under the Hazardous and Solid Waste Amendments (HSWA) of 1984, and consists of:

3004(u) - Corrective action for continuing releases;

3004(v) - Corrective action beyond the facility boundary; and,

3008(h) - Corrective action at Interim Status facilities.

The primary objective of the RCRA Corrective Action Program is the remediation of releases of hazardous wastes or constituents which threaten human health or the environment and is a four phase process consisting of:

1. RCRA Facility Assessment (RFA)
2. RCRA Facility Investigation (RFI)
3. Corrective Measures Study (CMS)
4. Corrective Measure Implementation (CMI)

In turn, the RFA is divided into three phases

1. Preliminary Review (PR)
2. Visual Site Inspection (VSI)
3. Sampling Visit (SV) (if necessary)

The purpose of the RFA is to:

-Identify and collate available information on releases at RCRA facilities;

-Evaluate Solid Waste Management Units (SWMUs) and other areas of concern for releases;

-Generate preliminary determinations regarding releases from SWMUs and areas of concern, and the need for further investigation and/or interim measures; and,

-Eliminate those SWMUs/areas which are not a threat to human health or the environment.

B. Scope

The RFA attempts to identify releases from all SWMUs and areas of concern to all media, i.e., the atmosphere, surface water, groundwater, soils and sediments. Note however, that releases to groundwater from regulated units are not addressed under RCRA Corrective Action authorities, but are regulated under 40 CFR 264/265 Subpart F.

II. Executive Summary

The Milford Proving Grounds is operated by the General Motors Corporation and is located near the town of Milford, Michigan. Covering approximately 4,000 acres, the facility's activities center upon new and ongoing product analysis i.e., vehicle testing. Included among the services provided by the facility to the Divisions of General Motors is the management and storage of hazardous waste. The facility is seeking a permit for a hazardous waste container storage area and a storage unit for depleted lithium batteries.

During the PR/VSI phase of the RFA, U.S. EPA investigators have gathered information on the SWMUs at the facility. The PR/VSI information is summarized in this report and was evaluated to determine the existence of past releases and the need for remediation.

The facility has three solid waste landfills and has documented releases from two hazardous waste underground storage tanks. At present, the company does not posses any hydrogeologic or ground water quality data on any of the landfills. Sampling and analysis on residual soils and ground water at one tank site was not performed, while date obtained at the second tank site indicates the need for further remediation. Furthermore, seven additional underground storage tanks for liquid hazardous wastes were removed in 1987. According to company representatives, none of these tanks were ever tested for leaks, nor were the adjacent soils or proximal ground water tested for the presence of residual contamination.

III. Preliminary Review

A. Purpose

The purpose of the PR is to gather and evaluate the existing information on the facility in order to identify and characterize potential releases. The information collected in the PR is also used to focus the activities associated with in the VSI and if necessary, the SV.

B. Scope

The scope of the PR is the identification and evaluation of releases to all environmental media resulting from waste management activities and releases subject to other U.S. EPA and State authorities (e.g., TSCA, CERCLA, Michigan Act 245, Michigan Act 641)

C. Facility Description

The General Motors (GM) Proving Ground is located near Milford, Michigan and covers approximately 4,000 acres. Established in 1924, the Milford Proving Grounds (MPG) is described by GM in the facility's Michigan Act 64 application as a "city within a city," possessing its own onsite fire, medical, waste-water treatment and power generating services. The MPG operates three shifts, 365 days per year, and employs approximately 4,000 individuals, has 86 buildings and 1.5 million square feet under roof.

Focused upon the support of new and ongoing product development, i.e., vehicle testing, MPG performs a wide variety of technical services for the numerous divisions of GM. Included among the services provided by MPG is the management and storage of hazardous waste.

There are two hazardous waste storage areas at MPG, the Container Storage Unit and the Lithium Battery Storage Unit. The Container Storage Unit located near the wastewater treatment plant (Bldg 19) and consists of an area approximately 26 by 8 feet with three sides, a roof, and a canvas cover for the open side. The floor consists of a grated collection trench with a secondary containment capacity of 366.5 gallons. The Container Storage Area provides storage for hazardous waste typically enclosed in Department of Transportation (DOT) 55 gallon drums, and has a storage capacity of 20 drums. The depleted Lithium Battery Storage Unit is located near the northeast corner of Building 16 and consists of a 10 foot by 14 foot free standing building with a roof and concrete floor. The storage capacity of the unit is 800 pounds. As stated in the Act 64 Application, "There is no history of spills or releases from storage or from handling of wastes at either hazardous waste storage unit over the course of their existence."

Hazardous wastes generated at the various satellite areas at MPG are collected in 5 gallon containers; subsequently placed in to DOT 17C and 17E 55 gallon drums and transferred to the Container Storage Area. The hazardous wastes which are typically stored in the Container Storage area include; waste solvents (F001), waste paint (D001), waste lacquers (F001, F003, F005, D007, D008), paint thinners (F001, F003, F005, D007, D008), waste mercury (D009), waste mercury batteries (D009), waste adhesives (D001), spill clean-up materials (D001), and other miscellaneous chemicals (D001). The Depleted Lithuim Battery Storage Unit is used only for the storage of expended lithuim batteries (D003). Individual batteries are sealed in zip-lock plastic bags and placed in DOT approved "4B" boxes.

G.M. representatives have identifid 48 Solid Waste Management Units (SWMUs) at the MPG facility. Table 1 was submitted by G.M. as part of the company's Act 64 Application for the MPG, and includes data outlining the SWMU type, a description of the SWMU waste types, placed waste volumes, and the time interval when the SWMU was in operation. For reference to SWMU locations, see the facility map (Attachment 1).

D. Geological/Hydrogeological Conditions

As G.M. has requested a waiver of the hydrogeological requirements under 299.9506 of Act 64, a hydrogeological description of the site was not included in the MPG Act 64 application.

E. Receptor Information

The MPG facility is located in rural area, the nearest community is the town of Milford approximately 5 miles from the site.

F. File Review/Compliance History

8-7-82 RCRA Compliance Inspection; no violations

6-16-83 RCRA Compliance Inspection

- Storage area not equipped with fire extinguishers
- Spill control equipment not listed in Contingency Plan
- Personnel evacuation plan not included in Contingency Plan

5-25-84 RCRA Compliance Inspection

- Contingency Plan did not reflect personnel changes
- Improper temporary storage of drumed waste

8-4-88 RCRA Compliance Inspection

- verification of submittal to local authorities unavailable
- waste analysis plan not amended to incorporate Land Ban waste verifications

IV. Visual Site Inspection (VSI)

A. Purpose

The purpose of the VSI is to identify and visually inspect the SWMUs at the facility for evidence of release. This information will be used as a basis for later steps in the corrective action process. The major objectives of the VSI include:

- Ensuring that all SWMUs and areas of concern have been identified;
- Visually inspecting the SWMUs and areas of concern at the facility for evidence of the release of hazardous wastes or constituents;
- Gathering information needed to fill data gaps identified in the PR; and,
- Focusing recommendations regarding the necessity for a subsequent sampling visit, or an RCRA Facility Investigation RFI.

B. Scope

The VSI includes the entire RCRA facility and if necessary can extend beyond the facility boundary. The VSI is generally limited to the collection of visual evidence (e.g., photographic documentation) of potential releases from SWMUs and areas of concern.

C. VSI Inspection Summary

A VSI was performed at the MPG facility in Milford, Michigan, on November 16, 1988. The following individuals were present during the VSI:

- William Hickok, G.M., Manager
- Carole Everett, G.M., Senior Environmental Engineer
- Perry Root, G.M., Senior Project Engineer
- Wayde Hartwick, U.S. EPA, Geologist
- David Petrovski, U.S. EPA, Geologist

The need to obtain an Act 64 RCRA license as well as a HSWA Federal permit was explained to facility representatives and the purpose and scope of the VSI and the corrective action program were summarized.

The SWMUs identified by GM at MPG were listed in the company's response to the questionaire entitled "Certification Regarding Potential Releases from Solid Waste Management Units." The 48 SWMUs identified by the Company are listed in Attachment II. All SWMU locations were viewed during the VSI. SWMUs which were photographed during the VSI are noted in Attachment II, and the photographs are included in Attachment III. The company has identified two prior releases of hazardous wastes at the site, which occurred at locations (SWMUs) 20 and 33. A summary of the release, remedial, and analytical data are given in Attachment IV. All photographs were taken by the Wayde Hartwick of U.S. EPA, developed by GM, and subsequently sent to U.S. EPA.

V. Suggestions for Further Action

A Preliminary Review (PR) and a Visual Site Inspection (VSI) have been conducted. Of the 48 SWMUs at the GM MPG facility, the following areas of concern exist and should be addressed in the Federal HSWA Permit.

A. Site #1, Vegetation Landfill: Disposal operations at this facility were initiated in 1960 and are on-going. Originally described as a "natural hole," approximately 200 cubic yards of shipping crates and vegetative landscape maintenance debris are placed in the facility per year. This facility should not represent a threat to proximal ground water resources, however, GM does not posses hydrogeologic or groundwater quality data to confirm this assumption. A hydrogeologic study of this area would assess the environmental significance of this disposal facility.

B. Site #2, Inert Material Landfill: Disposal operations at this facility were initiated in 1969 and are on-going. Described by G.M. as orginally a "natural hole," this landfill accepts approximately 2,000 cubic yards of inert construction debris annually (concrete, pavement, bricks, soil, etc). This facility should not represent a threat to proximal ground water resources, however, GM does not possess the hydrogeologic or ground water quality data to confirm this assumption.

A hydrogeological assessment of this facility would determine the environmental significance of this disposal facility.

C. Site #3, Closed Landfill: Covering 7500 square feet, the date disposal operations were initiated at the site is unknown. Operations at the facility were terminated in 1973. The only known materials placed in the facility consisted of 18-20 cubic feet of "pesticide wastes". Due to the size of the facility, it would appear that other waste materials were placed in the landfill. The nature of the other possible waste types is not known. The company does not possess any hydrogeologic or ground water quality data for this facility. A hydrogeologic assessment of this facility should be conducted to determine the presence or absense of soil/groundwater contamination.

D. SWMU 20, Underground Storage Tank #38: Tank #38 was installed in 1957 and was used to store waste gasoline and mineral spirits. Constructed of 1/4 inch single wall steel with an exterior bituminous coating, the tank had a capacity of 3,000 gallons.

On December 3, 1987, tank 38 was tested for tightness and was found to be leaking. The tank was excavated and removed on December 10, 1987. Approximately 22 cubic yards of visibly contaminated soil was also excavated and disposed of at Wayne Disposal in Belleville, Michigan. Four soil borings were constructed in the vicinity of the removed tank (1 upgradient, 3 downgradient). Two-inch PVC monitoring wells were installed at the locations of three of the borings. Groundwater and soil boring samples were analyzed for volatile organics and EP toxicity metals. A soil sample from boring #2 (downgradient) was found to contain 5mg/kg xylene, while xylene (3ug/l) and toluene (34 mg/l) were detected in ground water samples obtained from this well. A groundwater sample from well 1 (upgradient), was found to contain 220 mg/l of zylene. These data appear to document the presence of residual contamination and that further remediation is required (Attachment IV).

E. SWMU 33, Underground Storage Tank #145: Tank 145 was a 4,000 gallon fiberglass tank used to store chlorinated solvents, waste paints, thinners and mineral spirits. The tank was installed in 1974 and removed in 1982 after it was found to leak. According to company documentation, the quantity of fluid lost is unknown, but thought to be small. Although soil was excavated at the time the tank was removed, the quantity is not known. Sampling and analysis of residual soil and/or groundwater water has not been conducted. Due to the absence of documenation regarding the remediation of this SWMU additional sampling and analysis should be performed to document the presence or absence of groundwater/soil contamination (Attachment IV).

F. Removed Hazardous Waste Underground Storage Tanks

- Site 21, Tank #122A, 4,000 gallon steel tank; installed 1974, removed 1988
- Site 22, Tank #123, 1,000 gallon steel tank; installed 1966, removed 1987
- Site 23, Tank #124, 1,000 gallon steel tank; installed 1967, removed 1987
- Site 24, Tank #125, 1,000 gallon steel tank; installed 1972, removed 1987
- Site 25, Tank #127, 6,000 gallon steel tank installed 1971, removed 1987
- Site 26, Tank #127A, 10,000 gallon steel tank installed 1971, removed 1987
- Site 27, Tank #133, 500 gallon steel tank installed 1978, removed 1987

All of the underground storage tanks listed above were used to store liquid hazardous wastes and were removed during 1987/1988. According to company representatives, none of these tanks were ever tested for leaks, nor were the adjacent soils or proximal groundwater tested for the presence of contamination. Some form of soil/groundwater testing should be conducted to ensure that these tanks were not contamination sources.

G. Single-walled, In-place underground storage tanks

- Site 19, tank #93, 11,730 gallon fiberglass tank installed in 1985. In 1987, the hazardous waste in the tank was removed. GM plans to use the tank for the storage of product in the future.

- Site 30, tank #136, 1,500 gallon non-hazardous steel storage tank, installed in 1981.

- Site 34, tank #150, 12,000 gallon non-hazardous steel storage tank, installed in 1981.

The three underground storage tanks listed above are/were used for the storage of solid or hazardous wastes. As to date, these tanks have never been tested for integrity, leak tests should be conducted to determine their potential as sources for soil/groundwater contamination.

ATTACHMENT II

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
1.	Landfill P	Vegetation landfill covering 1/2 acre. Natural hole. Remaining capacity is 5-9 yrs.	Dead trees, prunings, shipping crates. No hazardous waste or constituents.	200 cu.yd. /yr.	1960 - present
2.	Landfill P	Inert Material landfill. Covers 1 acre. Natural hole. Remaining capacity 1-2 years.	Broken concrete, brick, masonry, pavement, uncontaminated soil. No hazardous wastes or constituents.	2000 cu. yd. /yr.	1969 - present
3.	Landfill P	Closed landfill - covers 7500 sq. ft. Last used in 1973.	Only known waste was pesticides.	18-20 cu. ft.	? - 1973
4.	Surface Impoundment P	Seepage pond - covers 9600 sq. ft. and is 1 ft. deep. Referred to as Outfall 003 under our NPDES Permit. Storm watershed.	Non-hazardous waste - wastewater and storm water runoff.	2-3 mgal /yr	1951 - present
5.	Surface Impoundment P	Mott "Lake" - covers 8 acres and is 4 ft. deep. Has an inlet and outlet. Storm watershed.	Non-hazardous waste - wastewater from Outfall 001 and storm water run-off flow through the the unit into Mann Creek.	62-84 mgal /yr - Known flows from 1978 to present	1924 - present
6.	Surface Impoundment P	Pickett "Lake" - covers 500,000 sq. ft. and is 7.5 ft. deep. Storm watershed.	Storm water run-off.	25-35 mgal /yr.	1951 - present
7.	Land Farm P	15 acre field located by the northwest end of the Military Straightaway. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	7 cu. yds. 16.4 cu. yds. 18 cu. yds.	6/26/87 4/12/88 6/16/88

P: photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
8.	Land Farm P	4.5 mile strip of land around the Circular Test Track covering about 70 acres. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an acrobic digester of an activated sludge system.	9.7 cu. yd. 7 cu. yd. 40 cu. yd. 35 cu. yd.	3/24/87 7/31/87 11/18/87 8/5/88
9.	Land Farm P	14 acre field inside the Truck Test Loop. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	100 cu. yd. /yr.	1978 - 1983
10.	Waste Pile P	20425 sq. ft. fenced-in storage area south of Bldg 73A. 50% of area is paved.	Compacted cars which have been drained of fluids. and metal car parts.	N.A.	1976 to present
11.	Waste Pile	86175 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped cars and metal car parts.	N.A.	1966 - 1976
12.	Waste Pile P	2080 sq. ft. fenced-in storage area north of Bldg 86.	Scrapped tires.	N.A.	1986 to present
13.	Waste Pile P	3500 Sq. Ft. Fenced-in storage area south of Bldg 73A.	Scrapped tires.	N.A.	1976 - 1986
14.	Waste Pile	900 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped tires.	N.A.	1966 - 1976
15.	Waste Pile	150 sq. ft. concrete storage area next to the old Butler Bldg under Water Tower #2	Scrapped lead acid batteries	N.A.	1960 - 1988

P: photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
16.	Incinerator P	Located in Bldg 18	Rubbish - paper prod.	N.A.	1954 - 1973
17.	Above ground tank P	(2) 10 gal capacity stainless steel tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - F001	N.A.	1981 - present
18.	Above ground tank P	30 gal capacity polyethylene tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - D002	N.A.	1981 - present
19.	Underground tank	Tank #93 - 11,730 gal. capacity fiberglass tank at Bldg 43. 90 day accumulation. (abandoned 1988)	Hazardous waste - D001, gasoline	N.A.	1985 - 1987
20.	Underground tank P	Tank #38 - 3,000 gal. capacity steel tank at Bldg 42A. 90 day accumulation. (removed 12/10/87)	Hazardous waste - D001, gasoline	N.A.	1987
21.	Underground tank	Tank #122A - 4,000 gal. capacity steel tank at Bldg 12. 90 day accumulation. (removed 1988)	Hazardous waste - engine oil, contaminated with F001	N.A.	1974 - 1988
22.	Underground tank	Tank #123 - 1,000 gal. capacity steel tank at Bldg 26. 90 day accumulation. (removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1966 - 1987
23.	Underground tank	Tank #124 - 1,000 gal. capacity steel tank at Bldg 27. 90 day accumulation. (Abandoned 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1967 - 1987
24.	Underground tank	Tank #125 - 1,000 gal. capacity steel tank at Bldg 32. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1972 - 1987

P: photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
25.	Underground tank	Tank #127 - 6,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
26.	Underground tank	Tank #127A - 10,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
27.	Underground tank	Tank #133 - 500 gal. capacity steel tank at Bldg 31. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1978 - 1987
28.	Underground tank	Tank #137 - 1,500 gal. capacity steel tank at Bldg 70. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1981 to present
29.	Underground tank	Tank #138 - 4,000 gal. capacity steel tank at Bldg 78. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1985 to present
30.	Underground tank	Tank #136 - 1,500 gal. capacity steel tank at Bldg 24.	Non-hazardous waste - hydraulic oil	N.A.	1981 to present
31.	Underground tank P	Tank #226 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - gasoline and petroleum distillates, D001.	N.A.	1/88 to present
32.	Underground tank P	Tank #227 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - oil contaminated with F001	N.A.	1/88 to present
33.	Underground tank	Tank #145 - 4,000 gal. fiberglass tank at Bldg 42D. (removed in 1982)	Hazardous waste - chlorinated solvents, paint & thinners, mineral spirits. F001, F003, F005, D001.	N.A.	1974 - 1980

P:photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
34.	Underground tank	Tank # 150 - 12,000 gal. steel tank at Bldg 42A.	Non-Hazardous process water.	N.A.	1981 to present
35.	Container storage area P	6 ft. x 25 ft. covered concrete area for storage of approximately 20 (55) gallon drums of waste located at Bldg 19. Containment provided.	Hazardous waste - chlorinated solvents, paints, paint thinners, mineral spirits, paint solids, adhesives.	N.A.	1981 to present
36.	Container storage area P	a 4 ft. x 6 ft. pallet in a 10 ft. x 14 ft. masonry building (Bldg 39) used for storage.	Hazardous waste - depleted lithium batteries (D003), waste.	N.A.	1982 to present
37.	Container Storage area P	A 10 ft. x 10 ft. curbed-in concrete storage area in Reynolds Barn. 270 day accumulation.	PCB contaminated hydraulic oil, rags & gloves; capacitors & lighting ballasts.	N.A.	1981 to present
38.	Container storage area P	A 10,000 sq. ft. paved area located by the barrel storage area north of Bldg 11.	Empty barrels once filled with hazardous or non-hazardous materials.	N.A.	1974 to present
39.	Wastewater Treatment Unit P	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1974 to present
40.	Wastewater Treatment Unit P	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1983 to present

P: photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
41.	Wastewater Treatment Unit P	Imhoff tank located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water.	N.A.	1943 - 1974
42.	Other - in ground tank P	Concrete storage or surge tank for the wastewater treatment units having the capacity of 160,000 gal located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1974 to present
43.	Other - in ground tank P	Concrete accumulation tank at Bldg 31. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1970 to present
44.	Other - in ground tank	Concrete accumulation tank at Bldg 70. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1981 to present
45.	Other - in ground tank	Concrete accumulation tank at Bldg 40. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1979 to present

P: photograph

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
46.	Other - sludge drying beds P	Two side-by-side concrete units covering 12,000 sq. ft. & having a total capacity of 64,000 gal located by Bldg 19. Equipped with a seepage collection system. Seepage pumped into wastewater storage tank.	Non-hazardous sludge from aerobic digester of wastewater treatment units.	N.A.	1986 to present
47.	Other - sludge drying beds P	12,000 sq. ft. graveled area located by Bldg 19.	Non-hazardous sludge from aerobic digester of wastewater treatment unit.	N.A.	1974 - 1986
48.	Container storage area P	29 ft x 20 ft paved area covered by a 3 sided building structure north of Bldg 11.	Non-hazardous waste - Scrapped lead-acid batteries. Unit also serves as a drop-off area for waste chemical materials generated on site.	N.A.	Sept. 1988 to present

P: photograph

ATTACHMENT III

SITE #1 (SWMU)

VEGETATION
LANDFILL

FACING WEST

PHOTO #: 1 of 29

GPO 838-888

SITE #2 (SWMU)

POWDER VALLEY LANDFILL
(INERT MATERIAL)

FACING NORTH

PHOTO #: 2 of 29

GPO 838-888

SITE (SWMU) #3

LANDFILL

FACING EAST

PHOTO #: 3 of 29

GPO 838-888

SITE (SWMU) #4

SEEPAGE POND
SURFACE IMPOUNDMENT

FACING NORTH

PHOTO #: 4 of 29

GPO 838-888

SITE (SWMU) #5

MOTT LAKE SURFACE
IMPOUNDMENT

FACING SOUTHEAST

PHOTO #: 5 of 29

GPO 838-888

SITE (SWMU) #6

PICKETT LAKE SURFACE
IMPOUNDMENT

PHOTO #: 6 of 29

GPO 838-888

SITE (SWMU) #7
LAND FARM
FACING WEST

PHOTO #: 7 of 29
GPO 835-339

SITE (SWMU) #9
LAND FARM
SOUTHEAST CORNER OF
TRUCK TEST LOOP
FACING NORTH

PHOTO #: 8 of 29
GPO 835-339

SITE (SWMU) #10
WASTE PILE
FACING NORTH
(NON-HAZARDOUS)

PHOTO #: 9 of 29
GPO 835-339

SITE (SWMU) # 12.
(NON-HAZARDOUS)
WASTE PILE

FACING EAST

PHOTO #: 10 of 29

GPO 838-389

SITE SWMU # 13
(NON-HAZARDOUS)
WASTE PILE

FACING WEST

PHOTO #: 11 of 29

GPO 838-389

SITE SWMU #15

PREVIOS LOCATION OF A
WASTE PILE

(NON-HAZARDOUS)

PHOTO #: 12 of 29

GPO 838-389

SITE (SWMU) #16
INCINERATOR BLDG.
USE DISCONTINUED IN 1973

FACING SOUTHEAST

PHOTO #: 13 of 29

SITES (SWMUs) 17 + 18

ABOVE GROUND TANKS

PHOTO #: 14 of 29

SITE (SWMU) #20
- FACING SOUTHEAST -
PREVIOS LOCATION OF UNDERGROUND STORAGE TANK #38
(3,000 GALLON CAPACITY)
REMOVED 12-10-87
PICTURE SHOWS TWO MONITORING WELLS

PHOTO #: 15 of 29

SITES (SWMUs) #31 + 32

UNDERGROUND STORAGE TANKS # 226 + 227

BOTH TANKS HAVE A CAPACITY OF 15,000 GALLONS

FACING SOUTHEAST

PHOTO #: 16 of 29

SITE (SWMU) #35

REGULATED HAZARDOUS WASTE CONTAINER STORAGE AREA

BACK OF FACILITY

FACING SOUTH

PHOTO #: 17 of 29

SITE (SWMU) #35

REGULATED HAZARDOUS WASTE CONTAINER STORAGE AREA

FLOOR GRATING + SUMP

PHOTO #: 18 of 29

SITE (SWMU) # 35

REGULATED HAZARDOUS CONTAINER STORAGE AREA

FRONT OF FACILITY - FACING EAST

PHOTO #: 19 of 29

GPO 835-559

SITE (SWMU) #36

REGULATED DEPLETED LITHIUM BATTERY STORAGE FACILITY

INTERIOR OF FACILITY

PHOTO #: 20 of 29

GPO 835-559

SITE (SWMU) #36

REGULATED DEPLETED LITHIUM BATTERY STORAGE FACILITY

EXTERIOR OF FACILITY

PHOTO #: 21 of 29

GPO 835-559

SITE (SWMU) #37

PCB STORAGE AREA

PHOTO #: 22 of 29

GPO 838-889

SITE SWMU #38

CONTAINER STORAGE AREA

NON-HAZARDOUS

PHOTO #: 23 of 29

GPO 838-889

SITES (SWMUs) #39 + 40

CLARIFIERS AT WASTEWATER TREATMENT PLANT

PHOTO #: 24 of 29

GPO 838-889

SITE (SWMU) #41
IMHOFF TANK
ASSOCIATED WITH
TA WASTEWATER
TREATMENT PLANT

NO LONGER USED
AFTER 1974

FACING EAST

PHOTO #: 25 of 29

SITE (SWMU) #42
CONCRETE STORM
SURGE TANK

160,000 GALLON
CAPACITY

ASSOCIATED WITH THE
WASTEWATER TREATMENT
FACILITY

FACING SOUTH

PHOTO #: 26 of 29

SITE (SWMU) #43
CONCRETE SEWAGE
ACCUMULATION TANK

PHOTO #: 27 of 29

SITES (SWMUs) #46 + 47

SEWAGE SLUDGE DRYING BEDS ASSOCIATED WITH WASTE WATER TREATMENT PLANT

PHOTO #: 28 of 29

GPO 838-859

SITE (SWMU) #48

LEAD/ACID BATTERY STORAGE

PHOTO #: 29 of 29

GPO 838-859

PHOTO #: _____ of _____

GPO 838-859

Burmah

VOLATILE ORGANIC ANALYSIS BY GAS CHROMATOGRAPHY

These compounds were included in the volatile organic analysis. Unless noted in the body of the report, they were not detected. The method detection level is 10 mg/kg.

Bromodichloromethane
Bromoform
Bromomethane
Carbon Tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane

1,1 Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene Chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethane
Trichlorofluoromethane
Vinyl Chloride

Benzene
Ethyl Benzene
Toluene
Xylenes
Styrene
Acetone
MEK
MIBK

WA/9r

APPENDIX C

Soil Boring Logs

COF —
SN —
File

Professional Service Industries, Inc.
Michigan Testing Engineers Division

April 25, 1988

McNamee, Porter and Seeley
3131 South State Street
Ann Arbor, Michigan 48104

Attention: Mr. Charles Fifield, P.E.

Re: Milford Proving Grounds
Soils Investigation and
Monitor Well Installation
Milford, Michigan
PSI No. 407-85008

Gentlemen:

On April 7 and 8, 1988, as per your request, Professional Service Industries, Inc., performed the above referenced soils investigation and monitor well installation.

Four (4) soil borings were performed on the site, in locations determined by the owner. They ranged in depth from twenty-two (22) feet to twenty-three (23) feet below the existing ground surface.

At the location of Borings Number 1, 2, and 3, two (2) inch, P.V.C. monitoring wells were installed to depths determined by the owner, so that groundwater samples may be obtained at a later date, if desired.

As the primary reason for this exploration was to locate any possible groundwater contamination near the former site of a fuel storage tank, no engineering analysis has been made by Professional Service Industries, Inc.. At the time the exploration was performed, all samples obtained were turned over to the client's representative for further laboratory analysis.

3772 Plaza Drive, Suite 1 • Ann Arbor, MI 48108 • Phone: 313/994-3210

Please find enclosed, four (4) Boring Logs, from our soil borings. These logs include descriptions of the soils encountered, sampling locations, and the depth at which groundwater was first encountered.

If we can be of any further assistance, or if further information is needed, please do no hesitate to contact us.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.
MICHIGAN TESTING ENGINEERS DIVISION

William L. Foster
Division Manager

WLF:lm

Enclosed:five

Professional Service Industries, Inc.

Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 1

PROJECT Milford Proving Grounds

JOB NO. 407-85008

LOCATION Milford, Michigan

SURFACE ELEV. 980.73' DATE 4-8-88

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Unc. Comp. Strength PSF Qu	Str. %
	1	Brown, fine to medium sand, moist, possible fill						
	2							
	3							
	4							
	5							
	6	Brown, fine to medium sand, moist						
	7							
	8	Brown, medium to coarse sand, wet						
	9							
	10							
	11		2					
	12		4					
SS	13		6					
	14		9					
	15		11					
	16		15					
	17		17					
	18		25					
	19							
	20		7					
	21		13					
SS	22		14					
	23		10					
	24	END OF BORING	4					
	25		7					
			13					
			17					

TYPE OF SAMPLE
- O - DISTURBED
- SS - SPLIT SPOON
- UL - UNDIST LINER
- TW - THIN WALL TUBE
- RC - ROCK CORE
- WS - WASHED SAMPLE

REMARKS: Set 2" PVC monitoring well

Hit boulder at 15 feet, hole had to be redrilled.

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	7	FT.	0	INS.
G W ENCOUNTERED AT	-	FT.	-	INS.
G W AFTER COMPLETION	-	FT.	-	INS.
G W AFTER - HRS.	-	FT.	-	INS.
G W VOLUMES	Heavy			

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 2

PROJECT Milford Proving Grounds

LOCATION Milford, Michigan

JOB NO. 407-85008

SURFACE ELEV. 979.79' DATE 4-7-88

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Unc. Comp. Strength PSF Qu	Str. %
	1	Brown, fine to medium sand, with some gravel, moist, possible fill						
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10		8					
	11		10					
	12	Brown, fine to medium sand, wet	10					
SS	13		6					
	14		4					
	15		7					
	16		5					
	17		6					
	18							
	19							
	20		2					
	21		7					
SS	22		10					
	23		19					
	24	End of Boring	6					
	25		13					
			17					
			21					

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS: Set 2" PVC monitoring well

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	7	FT.	0
G W ENCOUNTERED AT	-	FT.	-
G W AFTER COMPLETION	-	FT.	-
G W AFTER -	HRS. -	FT.	-
G W VOLUMES	Heavy		

GM Milford Hydrogeo.

Professional Service Industries, Inc.

Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 3

PROJECT Milford Proving Grounds

JOB NO. 407-85008

LOCATION Milford, Michigan

SURFACE ELEV. ------ DATE 4-8-88

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. WL P.C.F.	Unc. Comp. Strength PSF Qp	Unc. Comp. Strength PSF Qu	Str. %
		Asphalt pavement						
	1	Gravel-Base material						
	2	Brown, medium to coarse sand, with some gravel, moist						
	3							
	4							
	5							
	6							
	7							
	8							
	9	Brown, medium to coarse sand, with some gravel, wet						
	10							
	11		4					
	12		7					
SS	13		13					
	14		15					
	15		7					
	16		13					
	17		17					
	18	Brown, fine to medium sand, wet	20					
	19							
	20		3					
	21		5					
SS	22		10					
	23		12					
	24	END OF BORING	3					
	25		4					
			7					
			8					

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS: Set 2" PVC monitoring well

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	8	FT.	0	INS.
G W ENCOUNTERED AT	-	FT.	-	INS.
G W AFTER COMPLETION	-	FT.	-	INS.
G W AFTER - HRS. -		FT.	-	INS.
G W VOLUMES	Heavy			

Professional Service Industries, Inc.
Michigan Testing Engineers Division

LOG OF SOIL BORING NO. 4
PROJECT Milford Proving Ground
LOCATION Milford, Michigan

JOB NO. 407-85008
SURFACE ELEV. 980.33' DATE 4-7-88

Sample & Type	Depth	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Dry Den. Wt. P.C.F.	Unc. Comp. Strength PSF Qp	Unc. Comp. Strength PSF Qu	Sli. %
	1	Brown, medium to coarse sand, moist, possible fill	4					
SS	2		8					
	3		9					
	4		9					
	5		5					
	6		6					
	7		7					
	8	Brown, medium to coarse sand, wet, possible fill	6					
	9		2					
	10	Brown silt, wet	5					
	11	Brown, fine to medium sand, wet	5					
	12		3					
	13		3					
	14		1					
	15		1					
	16		1					
	17		3					
	18		4					
	19		5					
	20		6					
SS	21		3					
	22		4					
	23	END OF BORING	5					
	24		6					
	25							

TYPE OF SAMPLE
D - DISTURBED
SS - SPLIT SPOON
UL - UNDIST LINER
TW - THIN WALL TUBE
RC - ROCK CORE
WS - WASHED SAMPLE

REMARKS:

GROUND WATER OBSERVATIONS

G W ENCOUNTERED AT	7	FT. 0	IN.
G W ENCOUNTERED AT	-	FT. -	IN.
G W AFTER COMPLETION	-	FT. -	IN.
G W AFTER - HRS.	-	FT. -	INS.
G W VOLUMES	Heavy		

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.

Qu: Unconfined compressive strength, TSF

Qp: Penetrometer value, unconfined compressive strength, TSF

Mc: Water content, %

LL: Liquid limit, %

PI: Plasticity Index, %

δ_d: Natural dry density, PCF

▼: Apparent groundwater level at time noted after completion.

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
DB: Diamond Bit.
CB: Carbide Bit.
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	STANDARD PENETRATION RESISTANCE
Very Loose	0 - 2
Loose	2 - 4
Slightly Compact	4 - 8
Medium Dense	8 - 16
Dense	16 - 26
Very Dense	Over 26

TERM (COHESIVE SOILS)	Qu - (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

PSI G-100-9

APPENDIX D

Soil Sample Analyses

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

Follow-up Report

General Motors Corporation
G.M. Proving Ground
Milford, MI
Attn: Carole Everett, 23 - Plant Engineering
cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski, McNamee, Porter & Seeley

Underground Storage Tank Investigation

Analysis for Soil Borings
and Groundwaters

Received 4-11-88

July 21, 1988

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

Follow-Up Report

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36405
Client I.D.:	Boring 1 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	87
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.05

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 211 mls of 0.5 N acetic acid was 5.1.

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36406
Client I.D.:	Boring 1 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	91
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 77 mls of 0.5 N acetic acid was 5.2.

WA/2r

Susan K. Scott
Laboratory Supervisor

Burmah

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36407
Client I.D.:	Boring 1 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	86
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.08
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.05

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 127 mls of 0.5 N acetic acid was 5.2.

WA/3r

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36408
Client I.D.:	Boring 1 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	99
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 18 mls of 0.5 N acetic acid was 5.2.

WA/4r

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36409
Client I.D.:	Boring 2 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	89
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 49 mls of 0.5 N acetic acid was 5.0.

WA/5r

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

July 21, 1988

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36410
Client I.D.:	Boring 2 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	5
Xylenes, mg/kg	ND
Styrene, mg/kg	

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	0.02
Zinc, Zn, mg/l	

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 103 mls of 0.5 N acetic acid was 5.2.

WA/6r

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36411
Client I.D.:	Boring 2 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	87
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 35 mls of 0.5 N acetic acid was 5.2.

WA/7r

Susan K. Scott
Laboratory Supervisor

Burmah

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36412
Client I.D.:	Boring 2 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	84
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 238 mls of 0.5 N acetic acid was 5.0.

WA/8r

Susan K. Seed
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36413
Client I.D.:	Boring 3 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	90
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.19
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 360 mls of 0.5 N acetic acid was 5.2.

WA/9r

Susan K. Scott
Laboratory Supervisor

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36414
Client I.D.:	Boring 3 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	94
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.10
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected..

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 190 mls of 0.5 N acetic acid was 5.2.

WA/10r

Susan K. Scott
Laboratory Supervisor

Burmah

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G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36415
Client I.D.:	Boring 3 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	82
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.08
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 154 mls of 0.5 N acetic acid was 5.0.

WA/11r

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July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36416
Client I.D.:	Boring 3 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.05
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 51 mls of 0.5 N acetic acid was 5.2.

WA/12r

Susan K. Scott
Laboratory Supervisor

Burmah

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General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36417
Client I.D.:	Boring 4 9'-11'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.17
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.37

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 400 mls of 0.5 N acetic acid was 5.2.

WA/13r

Susan K. Scott
Laboratory Supervisor

Burmah

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Analytical Laboratories Division

408 Auburn Avenue
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313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36418
Client I.D.:	Boring 4 11'-13'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	92
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.05
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 86 mls of 0.5 N acetic acid was 5.1.

WA/14r

Susan K. Scott
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Burmah

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313-334-4747

July 21, 1988

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36419
Client I.D.:	Boring 4 18'-20'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.04

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 220 mls of 0.5 N acetic acid was 5.1.

WA/15r

Susan K. Scott
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July 21, 1988

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36420
Client I.D.:	Boring 4 20'-22'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	88
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 16 mls of 0.5 N acetic acid was 5.1.

WA/16r

Susan K. Scott
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General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

	Detection Limits	Methodology
As Received:		
Total Solids @ 104 °C, %	--	1310
Volatile Organic Analysis: (Method 8020), mg/kg	2	8020
EP Toxicity:		
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

WA/17r

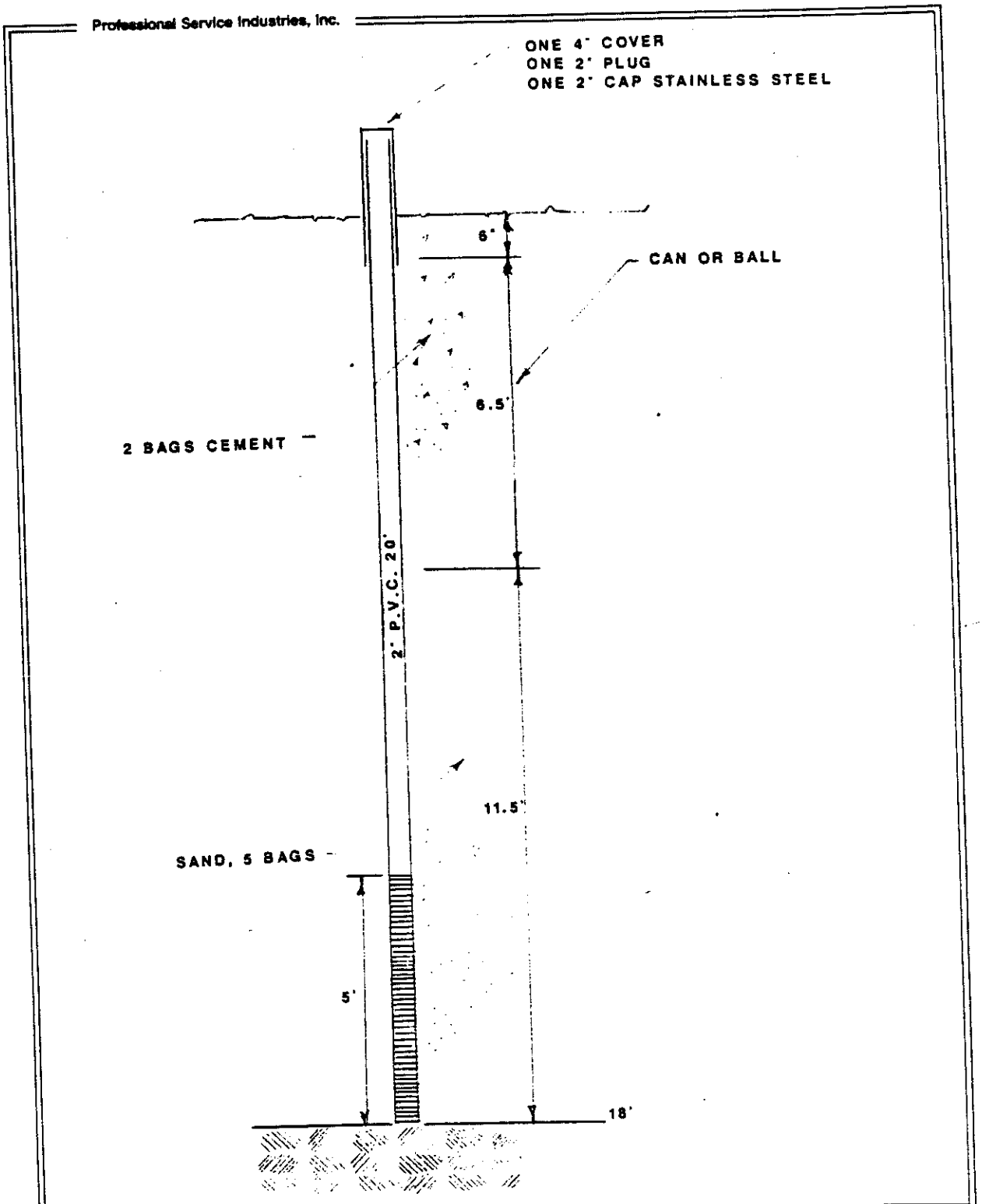
Susan K. Scott
Laboratory Supervisor

APPENDIX E

Monitoring Well Sketches and

Groundwater Flow Direction Calculations

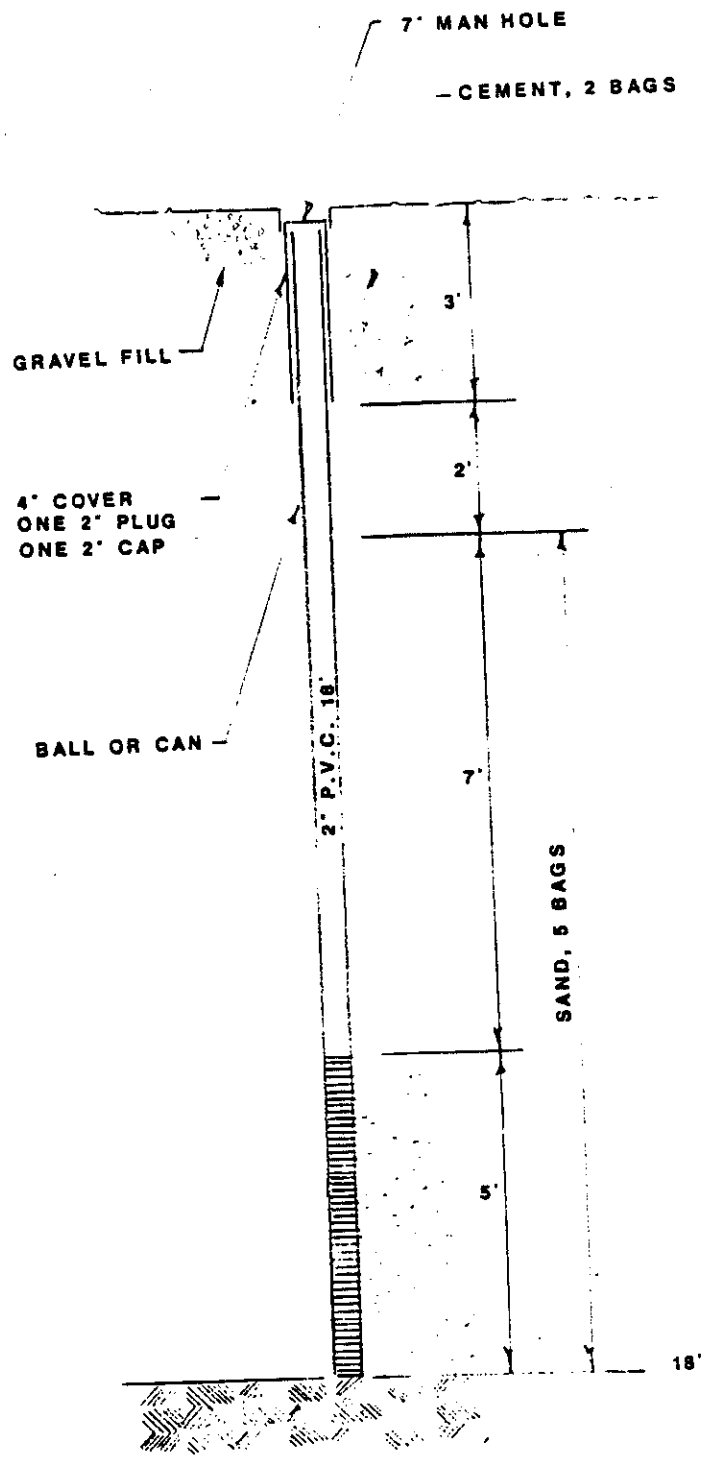
Professional Service Industries, Inc.



PROJECT NAME		DRW. NO.
Milford Proving Ground	**MONITORING WELLS NOS. 1 AND 2**	
	PROJECT NO. 407-85008	DATE 4/07/88

PSI A-700-6

Professional Service Industries, Inc.



PROJECT NAME		DRW. NO.
Milford Proving Ground	**MONITORING WELL NO. 3**	
	PROJECT NO. 407-85008	DATE 4/07/88

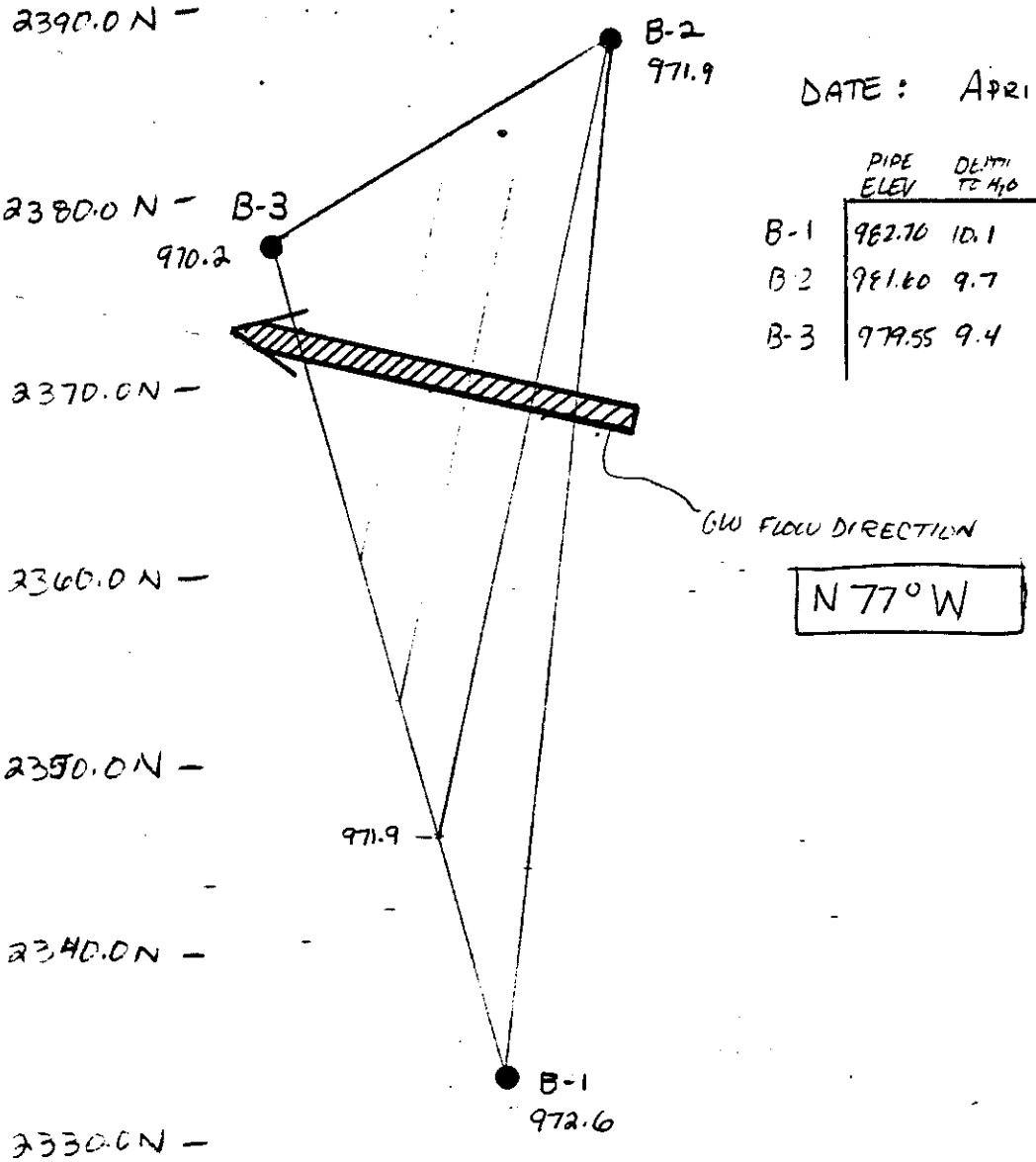
PSI A-700-6

GM MILFORD PG HYDROCLO - TANK #3E

GW FLOW DIRECTION

KLC 6/23/88

SCALE: 1" = 10'



DATE: APRIL 11, 1988

	PIPE ELEV	DEPTH TO H_2O	H_2O ELEV
B-1	982.70	10.1	972.6
B-2	981.60	9.7	971.9
B-3	979.55	9.4	970.2

MONITORING WELL COORDINATES

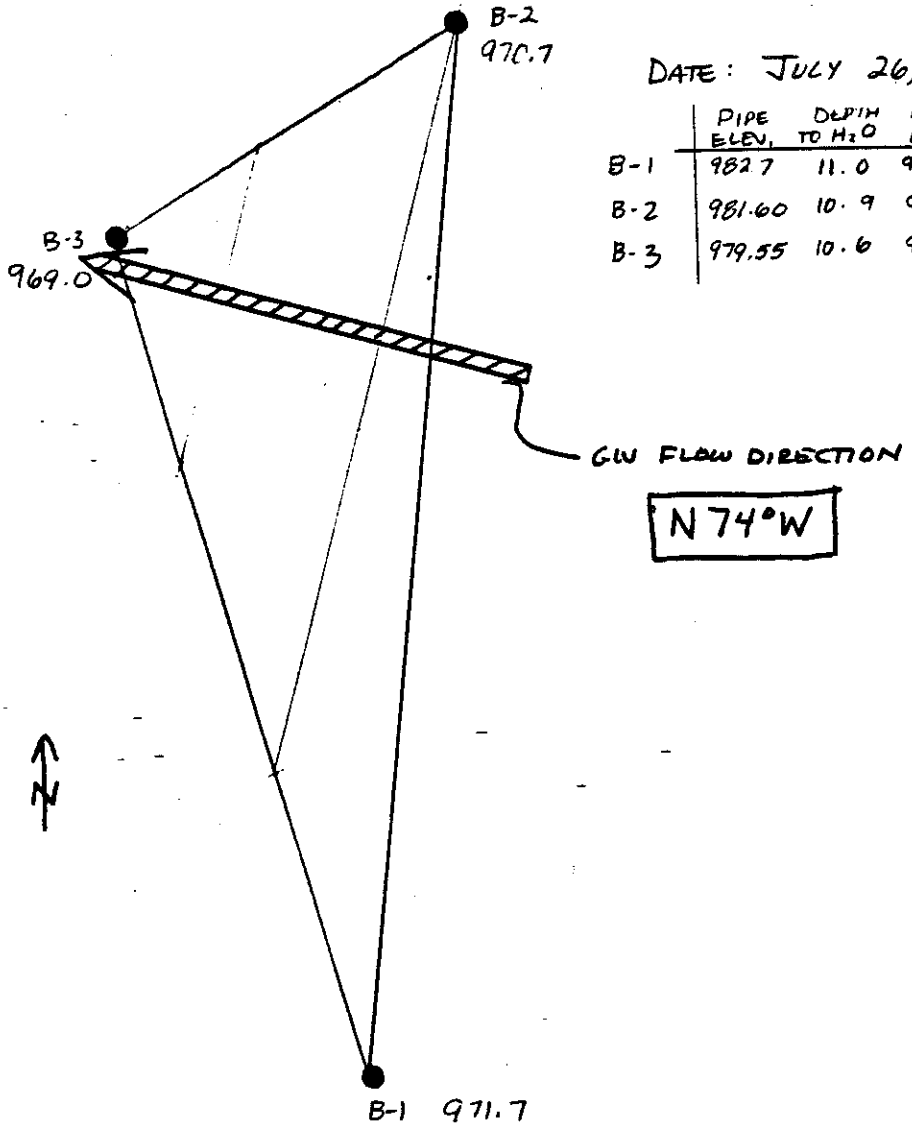
B-1	2333.72 N	1263.36 W
B-2	2388.61 N	1277.53 W
B-3	2377.48 N	1295.56 W

1300.0 W | 12900 W | 1280.0 W | 1270.0 W | 12600 W | 12500 W

GM MILFORD PG HYDROCEO - TANK #38

GW FLOW DIRECTION

ALC 8/8/88 SCALE: 1" = 10'



DATE: JULY 26, 1988

	PIPE ELEV.	DEPTH TO H_2O	H_2O ELEV.
B-1	982.7	11.0	971.7
B-2	981.60	10.9	970.7
B-3	979.55	10.6	969.0

APPENDIX F

Groundwater Testing Results

Burmah

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

General Motors Corporation
G. M. Proving Ground
Milford, MI 48042-2002
Attn: Carol Everett, 23 - Plant Engineering

July 21, 1988

Follow-up Report

PROGRAM: GROUNDWATERS - UST

Date Received: 4-11-88

ALD Number:		36349	36350	36351
Client I.D.:	MCL	B-1 4-11-88	B-2 4-11-88	B-3 4-11-88
Volatile Organic Analysis:				
Chlorobenzene, ug/l	500	ND	ND	ND
1,2-Dichlorobenzene, ug/l	620	ND	ND	ND
1,3-Dichlorobenzene, ug/l	620	ND	ND	ND
1,4-Dichlorobenzene, ug/l	75	ND	ND	ND
Benzene, ug/l	5	ND	ND	ND
Ethyl Benzene, ug/l	680	ND	ND	ND
Toluene, ug/l	2000	ND	34	ND
Xylenes, ug/l	[illegible]	220	3	ND
Styrene, ug/l	140	ND	ND	ND
Arsenic, As, mg/l	0.05	0.47 *	0.55 *	0.13 *
Barium, Ba, mg/l	1.0	1.0	4.7 *	1.2 *
Cadmium, Cd, mg/l	[illegible]	0.03 *	0.04 *	ND
Chromium, Cr, mg/l	0.05	0.23 *	0.33 *	0.06 *
Lead, Pb, mg/l	[illegible]	0.72 *	0.45 *	0.08 *
Mercury, Hg, mg/l	[illegible]	0.0016	0.0010	ND
Selenium, Se, mg/l	[illegible]	0.14 *	ND	ND
Silver, Ag, mg/l	[illegible]	ND	ND	ND
Copper, Cu, mg/l	1.0	1.1 *	0.51	0.11
Zinc, Zn, mg/l	5.0	2.8	2.9	0.61

ND - None Detected.

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

Original Report: 5-11-88

H2O/1L

Susan K. Scott
Laboratory Supervisor

Burmah

General Motors Corporation
G. M. Proving Ground
Attn: Carol Everett, 23 - Plant Engineering

July 21, 1988

PROGRAM: GROUNDWATERS - UST

	Routine Detection Limits	Methodology
Volatile Organic Analysis:		
Chlorobenzene, ug/l	2	8020
1,2-Dichlorobenzene, ug/l	10	8020
1,3-Dichlorobenzene, ug/l	10	8020
1,4-Dichlorobenzene, ug/l	10	8020
Benzene, ug/l	2	8020
Ethyl Benzene, ug/l	2	8020
Toluene, ug/l	2	8020
Xylenes, ug/l	2	8020
Styrene, ug/l	2	8020
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

H2O/2L

Burmah

G.M. Proving Ground
Attn: Carole Everett

May 11, 1988

PROGRAM: GROUNDWATERS - UST

FIELD NOTES

Initial Objectives:

Obtain static water measurements, evacuate 3 times the standing water volume and obtain a representative water sample from 3 wells.

Work Completed:

Date Completed: April 11, 1988
Weather: Clear, 50's

Static water levels were obtained. Wells were evacuated and sampled immediately. See Table I.

Equipment & Methods:

Static water measurements were obtained using a Q.E.D. Well Wizard Model 6000 Water Level Indicator, evacuations were performed using a teflon bailer with polypropylene rope. A new section of rope was used at each well. All equipment was thoroughly rinsed between each well. Work was performed by Burmah Technical Services personnel B. Thomas and C. Gauthier.

TABLE I

Well Number	Well Type	Static Water Level (ft)	Bottom Depth (ft)	Quantity Evacuated
B-1	2" Tef.	10.1	20.0	4.75 Gal.
B-2	2" Tef.	9.7	20.0	5.00 Gal.
B-3	2" Tef.	9.4	20.0	5.00 Gal.

H2O/3L

Burmah

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

General Motors Corporation
G. M. Proving Ground
Milford, MI 48042-2002
Attn: Carol Everett, 23 - Plant Engineering

August 19, 1988

P.O. #PGB00382, Rel. #006327

PROGRAM: GROUNDWATERS - UST (Resamples)

Date Received: 7-26-88

ALD Number:		41693	41694	41695
Client I.D.:	MCL	B-1 7-26-88	B-2 7-26-88	B-3 7-26-88
Volatile Organic Analysis:				
Chlorobenzene, ug/l	600	ND	ND	ND
1,2-Dichlorobenzene, ug/l	620	ND	ND	ND
1,3-Dichlorobenzene, ug/l	620	ND	ND	ND
1,4-Dichlorobenzene, ug/l	75	ND	ND	ND
Benzene, ug/l	5	ND	ND	ND
Ethyl Benzene, ug/l	680	ND	ND	ND
Toluene, ug/l	2000	ND	ND	ND
Xylenes, ug/l	440	ND	ND	ND
Styrene, ug/l	140	ND	ND	ND
Arsenic, As, mg/l	0.05	0.28 *	0.26 *	0.12 *
Barium, Ba, mg/l	1.0	0.53	2.4 *	0.54
Cadmium, Cd, mg/l	0.01	0.12 *	0.25 *	0.02 *
Chromium, Cr, mg/l	0.05	0.18 *	0.30 *	0.04
Lead, Pb, mg/l	0.05	0.24 *	0.11 *	ND
Mercury, Hg, mg/l	0.002	ND	ND	ND
Selenium, Se, mg/l	0.01	0.073 *	ND	ND
Silver, Ag, mg/l	0.05	ND	ND	ND
Copper, Cu, mg/l	1.0	0.55	0.28	0.05
Zinc, Zn, mg/l	5.0	1.4	1.5	0.29

ND - None Detected.

RECEIVED
AUG 25 1988
McNAMEE, PORTER & SEELEY
BY

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

H2O/1K

Susan K. Scott
Laboratory Supervisor

Burmah

General Motors Corporation
G. M. Proving Ground
Attn: Carol Everett, 23 - Plant Engineering

August 19, 1988

PROGRAM: GROUNDWATERS - UST (Resamples)

	Routine Detection Limits	Methodology
Volatile Organic Analysis:		
Chlorobenzene, ug/l	2	8020
1,2-Dichlorobenzene, ug/l	10	8020
1,3-Dichlorobenzene, ug/l	10	8020
1,4-Dichlorobenzene, ug/l	10	8020
Benzene, ug/l	2	8020
Ethyl Benzene, ug/l	2	8020
Toluene, ug/l	2	8020
Xylenes, ug/l	2	8020
Styrene, ug/l	2	8020
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

H2O/2L

Burmah

G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

August 19, 1983

PROGRAM: GROUNDWATERS - UST (Resamples)

FIELD NOTES

Initial Objectives:

Obtain static water measurements, evacuate 3 times the standing water volume and obtain a representative water sample from 3 wells.

Work Completed:

Date Completed: July 26, 1988
Weather: Clear, 70's

Static water levels were obtained. Wells were evacuated and sampled immediately. See Table I.

Equipment & Methods:

Static water measurements were obtained using a Q.E.D. Well Wizard Model 6000 Water Level Indicator, evacuations were performed using a teflon bailer with polypropylene rope. A new section of rope was used at each well. All equipment was thoroughly rinsed between each well. Work was performed by Burmah Technical Services personnel B. Thomas and C. Gauthier.

TABLE I

Well Number	Well Type	Static Water Level (ft)	Bottom Depth (ft)	Quantity Evacuated
B-1	2" Tef.	11.00	20.0	4.32 Gal.
B-2	2" Tef.	10.90	20.0	4.38 Gal.
B-3	2" Tef.	10.60	20.0	4.50 Gal.

H20/3k

APPENDIX G

General Qualifications

GENERAL QUALIFICATIONS

The analyses and recommendations submitted in this report are based upon data obtained from soil borings performed at locations which are indicated on the location diagram and from other information as outlined in the report. This report does not reflect any variations which may occur between the boring locations; rather, specific information was obtained at the specific boring location at specific times. It is a well-known fact that variations in soil, rock and groundwater conditions can occur between boring locations. Subsurface interpretation is based on conditions where borings were drilled. Conditions may vary between boring locations.

In addition, groundwater monitoring wells were installed on this project. It can be expected that groundwater levels may vary seasonally and annually due to precipitation, evaporation, surface runoff, and percolation. Variations of several feet are not uncommon. Therefore, interpretations made concerning the groundwater characteristics using the available monitoring well readings are estimates based on the experience of the Engineer.

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah
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General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received:	12-17-87
ALD Number:	31657
Client I.D.:	Gas contaminated soil 12-15-87
Physical Description:	100% Brown soil

Volatile Organic Analysis:

Petroleum Distillates, mg/kg	250-300

Please note that this additional volatile analysis was requested and performed one month after sample was originally received and analyzed.

Please see attached sheet for additional notes, detection limits, and complete listing of compounds included in the volatile organic analysis.

WA/2r

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received: 12-17-87

ALD Number: 31657

Client I.D.: Gas contaminated soil
12-15-87

Halogenated, mg/kg:	
Bromodichloromethane	<2
Bromoform	<10
Bromomethane	<5
Carbon Tetrachloride	<2
Chlorobenzene	<2
Chloroethane	<2
2-Chloroethylvinyl ether	<5
Chloroform	<2
Chloromethane	<5
Dibromochloromethane	<5
1,2-Dichlorobenzene	<10
1,3-Dichlorobenzene	<10
1,4-Dichlorobenzene	<10
Dichlorodifluoromethane	<2
1,1-Dichloroethane	<2
1,2-Dichloroethane	<2
1,1-Dichloroethene	<2
Trans-1,2-Dichloroethene	<2
1,2-Dichloropropane	<2
Cis-1,3-Dichloropropene	<2
Trans-1,3-Dichloropropene	<2
Methylene Chloride	<2
1,1,2,2-Tetrachloroethane	<2
Tetrachloroethene	<2
1,1,1-Trichloroethane	<2
1,1,2-Trichloroethane	<2
Trichloroethene	<2
Trichlorofluoromethane	<2
Vinyl Chloride	<5

Aromatic, mg/kg:	
Benzene	<2
Ethyl Benzene	<2
Toluene	<2
Xylenes	<2

EPA Method 601 & 602

WA/3c

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38 MID 0082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah

Burmah Technical Services, Inc.
Analytical Laboratories Division

408 Auburn Avenue
Pontiac, Michigan 48058

313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received:	12-17-87
ALD Number:	31657
Client I.D.:	Gas contaminated soil 12-15-87
Physical Description:	100% Brown soil

As Received:

Total Solids @ 104°C, %	84
Ignitability, °F	>200
Reactive Cyanide, CN, mg/kg	<1
Reactive Sulfide, S_2, mg/kg	<2
Thallium, Tl, mg/kg	22
Nickel, Ni, mg/kg	6.7

EP Toxicity:

Arsenic, As, mg/l	<0.005
Barium, Ba, mg/l	0.13
Cadmium, Cd, mg/l	<0.01
Chromium, Cr, mg/l	<0.02
Lead, Pb, mg/l	<0.05
Mercury, Hg, mg/l	<0.0005
Selenium, Se, mg/l	<0.005
Silver, Ag, mg/l	<0.02
Copper, Cu, mg/l	<0.02
Zinc, Zn, mg/l	0.06
Cyanide, CN, mg/l	<0.02

cc: Ernie Mecham

Susan K. Scott
Laboratory Supervisor

WA/lr

ATTACHMENT IV

SITE NUMBER & DESCRIPTION	DATE OF RELEASE	TYPE OF WASTE RELEASED	QUANTITY RELEASED	DESCRIPTION OF RELEASE
Site #20 - underground tank #38.	12/04/87 date detected	Petroleum distillates	Quantity unknown, believed to be small. Investigation on-going.	Leak from tank piping system at the tank site.
Site #33 - underground tank #145.	Nov. 1982 date detected	Chlorinated solvents, paint & paint thinners, mineral spirits.	Quantity unknown, believed to be small.	Leak from a small hole in bottom of tank.

ATTACHMENT III, QUESTION 4. SITE #33, TANK #145. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48058
313 334-1630
313 334-4747

12-1-82

GM Proving Grounds

Milford, MI 48042
Attn: Ms. Carole Everett

P.O. # PGM 679584

Rel # 42546

Sample received:	11-29-82
Hydro Number:	59802
Client I.D.	Contaminated Dirt
Flash Point °F.	83
Density, g/ml	1.81

Linda Deans/ss
Linda Deans
General Laboratory Manager

Notification of Hazardous Waste Site

United States
Environmental Protection
Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: General Motors Proving Ground
Street: Hickory Ridge Road
City: Milford State: MI Zip Code: 48042

3 Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: same
Street:
City: County: State: Zip Code:

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Leitz, H. P., Mgr. - Facility Services
Phone: 313-685-5180

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1973 To (Year): One Time Disposal

E Waste Type: Choose the option you prefer to complete

Option 1: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste:
Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☒ Organics
2. ☒ Inorganics
3. ☐ Solvents
4. ☒ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste:
Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. ☒ Other (Specify)

Outdated chemicals

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste:
EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

Form Approved
OMB No. 2000-0138

Notification of Hazardous Waste Site — Side Two

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. ☒ Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☒ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet 18-20

gallons _____

Total Facility Area

square feet 150

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment.

☐ Known ☐ Suspected ☒ Likely ☐ None

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required

Name Kelly. A. H.

General Motors Proving Ground

Street Hickory Ridge Road

City Milford State MI Zip Code 48042

Signature _____ Date June 1, 1981

☒ Owner, Present
☒ Owner, Past
☐ Transporter
☐ Operator, Present
☒ Operator, Past
☐ Other

GENERAL MOTORS CORPORATION

MILFORD PROVING GROUNDS

MILFORD, MICHIGAN

Hydrogeological Study

Hazardous Waste 90-Day Accumulation

Tank (No. 38) Site

Prepared By:

ISD/McNamee, Porter and Seeley
Engineers/Architects
3131 South State Street
Ann Arbor, MI 48108

January 1989

ACKNOWLEDGEMENT

We wish to acknowledge the assistance and cooperation from the General Motors Proving Ground personnel. In particular, we wish to thank Mr. Ernie Mecham and Ms. Carole Everett for their efforts in coordination and collection of soils and groundwater samples and analysis.

CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

SUMMARY

A hydrogeologic investigation was performed at the site of a leaking underground hazardous waste tank located on the GM Proving Grounds, Milford, Michigan. The objectives were to determine the groundwater and soil characteristics and to demonstrate clean closure of the site.

The tank including the fittings and the excavated soil were properly disposed of according to appropriate Federal and State regulations. Four soil borings were performed and groundwater monitoring wells were installed in three of the borings. Soil and water samples were collected and analyzed by Burmah Technical Services.

CONCLUSIONS

The procedures used to dispose of the tank and soil complied with the requirements of 40 CFR 265.111, 265.114 and 265.197. Soil sample analysis indicated that there is no significant contamination remaining. Likewise, the analysis of the groundwater samples indicates that there were no volatile organics detected. Some metals do appear in the sample reports; however, their presence may be as explained under the Discussion of Results, Water Analysis section of this report.

RECOMMENDATIONS

Based on the present investigation and results, remedial actions are complete at Tank No. 38 Site and the files can be closed.

INTRODUCTION

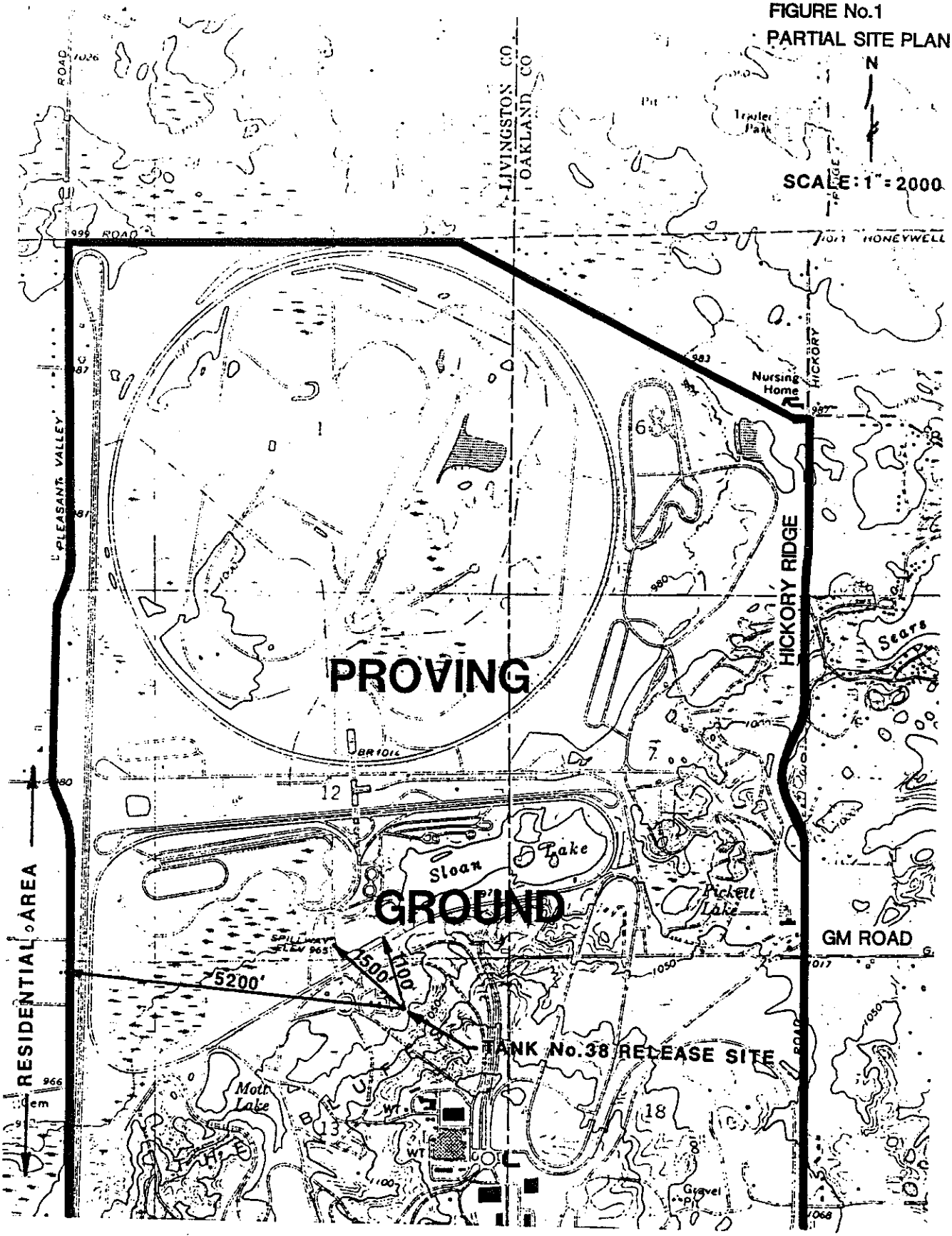
GENERAL

In December of 1987, the General Motors Proving Ground in Milford, Michigan (Figure 1) had an integrity assessment performed on three (3) hazardous waste underground accumulation tanks as required under 40 CFR 265.191. One tank (Tank #38), used for storing ignitable wastes on a less than 90 day basis, failed a precision test. The required notifications were made, including a report submitted to Region V and Michigan DNR as required in 40 CFR Part 265.196(d)(3) on December 23, 1987. This report summarizes the subsurface exploration which was performed as supervised and prepared by personnel of ISD/McNamee, Porter and Seeley for the GM Proving Ground.

OBJECTIVE

The objective of this report is to demonstrate that this tank system has been closed as stipulated under 40 CFR 265.197(a), whereby the Owner has removed or decontaminated all waste residues, contaminated containment components, contaminated soils, and structures and equipment contaminated with waste, and managed them as hazardous waste.

FIGURE No.1
PARTIAL SITE PLAN



GM Milford Hydrogeo.

BACKGROUND INFORMATION

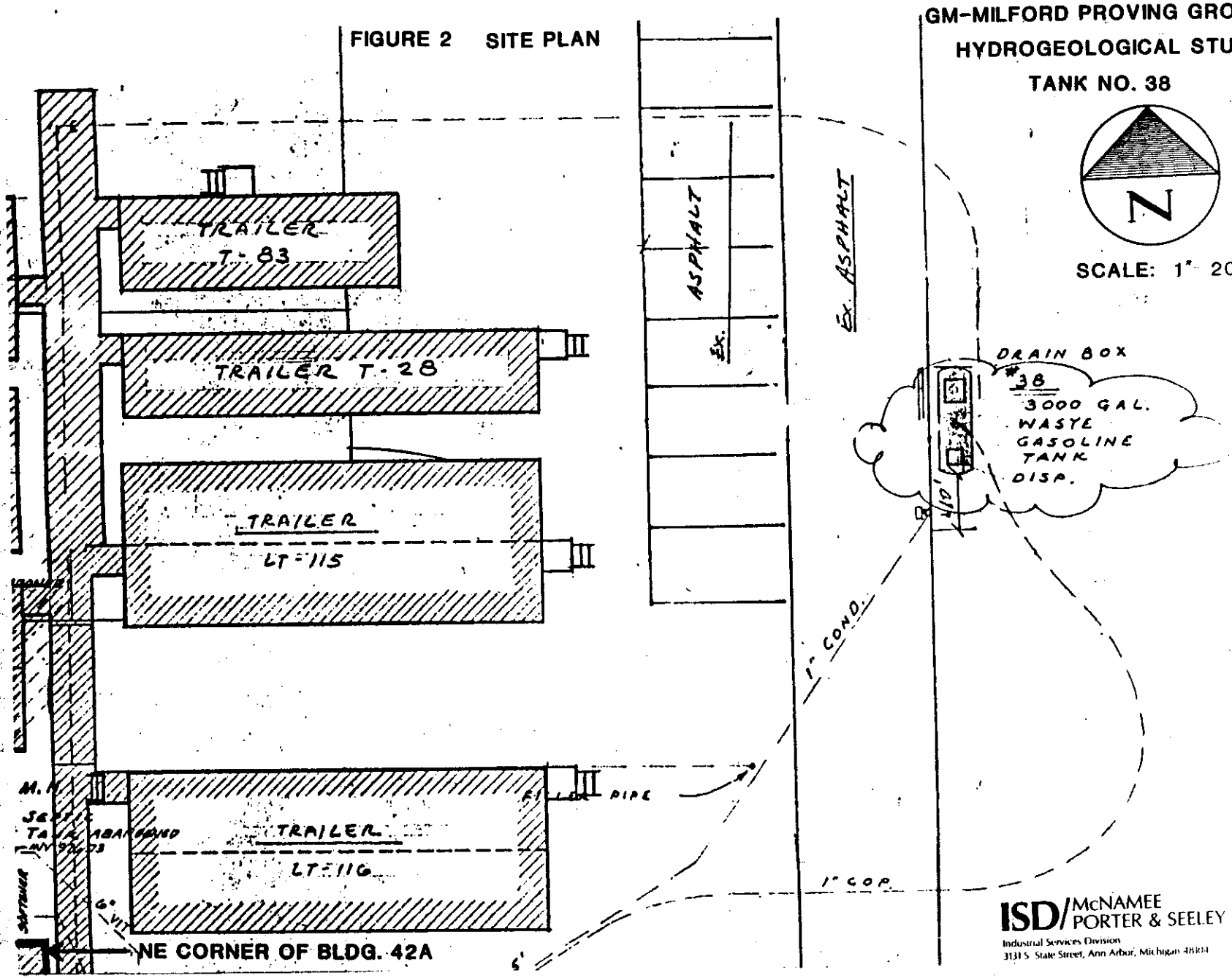
Tank No. 38, located near Building 42-A (see Figure 2), was installed in 1957 and has been used to store three types of wastes: gasoline, GM 1150 (gasoline type product) and mineral spirits. The tank was constructed of 1/4-inch steel (single wall) with exterior bitumastic coating. The volume of the tank was 3,000 gallons.

On December 3, 1987, Tank No. 38 was tested by Petro Service Co., Inc., for tightness. The testing concluded that this tank system was leaking. (See Appendix A.)

The tank was removed from the ground on December 10, 1987. Upon removal, a loose fitting in the fill line was determined to be the cause of the leak. The tank was not leaking as the test had indicated and was in good condition. Visibly contaminated soils including about 3 to 4 feet beyond was removed and stockpiled (approximately 22 cu. yards) on a black top area. VISQUEEN was placed beneath and on top of soil to protect it from weather. The hole was then backfilled with clean soil on December 17, 1987. The tank interior was cleaned and the contents disposed of as hazardous waste at Petro-Chem Processing, Inc. The tank itself was removed from the PG site by D&H Richman Excavating, Inc. of Union Lake, Michigan in June of 1988, and was cut up and disposed of as scrap metal. The contaminated soil was disposed of at the Wayne Disposal Landfill in Belleville, Michigan, on July 28, 1988.

FIGURE 2 SITE PLAN

GM-MILFORD PROVING GROUNDS
HYDROGEOLOGICAL STUDY
TANK NO. 38



ISD/McNAMEE PORTER & SEELEY
Industrial Services Division
3131 S. State Street, Ann Arbor, Michigan 48104

INVESTIGATIONS

The purposes of the hydrogeological investigation were to determine that all contaminated soil was removed and to assess the soil and groundwater characteristics.

SOILS INVESTIGATION

A sample of the excavated soil was taken by Burmah Technical Services on December 15, 1987. Due to handling error by the laboratory, a second sample was taken on April 28, 1988, when the soil had thawed. The results of this analysis are included in Appendix B. The analysis did not show any significant contamination.

Four soil borings were performed in the vicinity where Tank No. 38 was located (See Figure 3). The soil boring logs are included in Appendix C. Boring No. 1 (B-1) was to serve as an apparent upgradient sampling location for background conditions. Boring No. 2 (B-2) and Boring No. 3 (B-3) were to provide information about any contamination migration in the down-gradient direction. Boring No. 4 (B-4) was used to obtain a sample of the native soil under the clean backfill where Tank No. 38 was located.

The drilling equipment (augers, rods and split spoon sampler) was steam cleaned between borings to prevent cross-contamination. Additionally, the split spoon sampler was washed between samples taken in each boring.

Soil samples were taken in each boring upon encountering groundwater, and approximately every five feet after that up to a depth of 23 feet. All soil samples were taken using a split spoon sampler. The outside surface of each sample was stripped prior to being placed into sample jars. Each sample was tested for volatile organics and EP toxicity metals by Burmah Technical Services, Inc. The results of the soils testing are included in Appendix D.

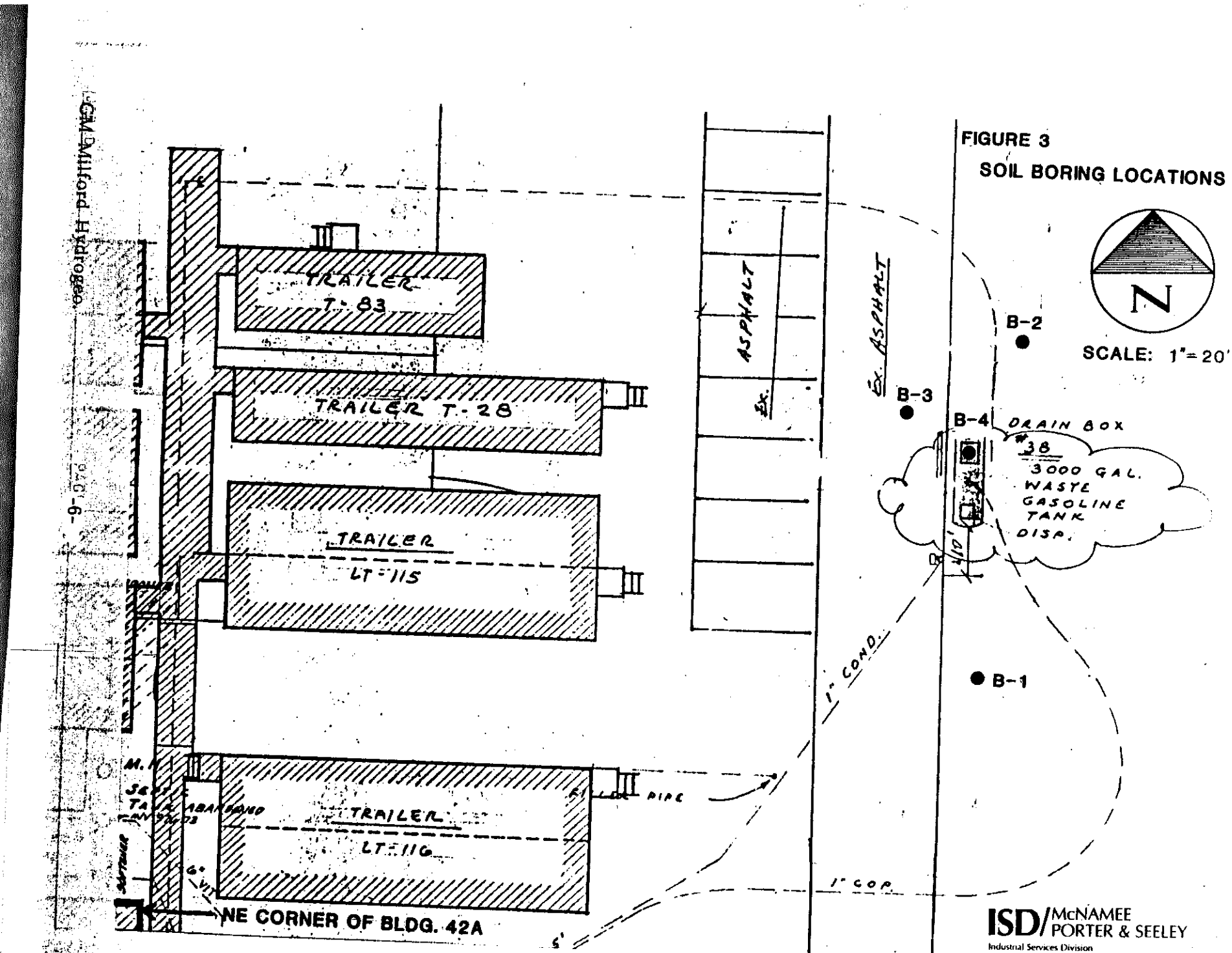


FIGURE 3

SOIL BORING LOCATIONS

ISD/McNAMEE PORTER & SEELEY

Industrial Services Division

3131 S. State Street, Ann Arbor, Michigan 48104

GROUNDWATER INVESTIGATION

Two-inch PVC monitoring wells were installed in the locations of Borings 1, 2 and 3. Sketches of the monitoring well construction are included in Appendix E.

Burmah Technical Services, Inc., collected water samples and obtained static water level measurements from the three monitoring wells on two occasions (April 11 and July 26, 1988). Static water measurements were obtained using a QED Well Wizard Model 6000 water level indicator. The direction of groundwater flow was calculated from the static water elevations obtained. These calculations are included in Appendix E and demonstrated consistancy. The average direction of groundwater flow was found to be 75 degrees West of North (N75^{o}W).

The standing water volume of the well was evacuated three times prior to obtaining water sample. Evacuations were performed using a Teflon bailer with polypropylene rope. A new section of rope was used at each well and all equipment was thoroughly rinsed between each well. The groundwater samples were analyzed by Burmah Technical Services for volatile organics and RCRA metals. The results of these analyses are included in Appendix F.

DISCUSSION OF RESULTS

SOIL ANALYSES

Soil Boring No. 1 (B-1) was located in the confirmed upgradient direction of groundwater flow. The results of the soil sample analyses for B-1 are used as "Background" concentrations of the native soil conditions to which the other soils are compared. B-1 does not show any concentrations of volatile organic substances at any depth.

Soil Boring No. 2 (B-2) was located somewhat in the downgradient direction from where Tank No. 38 was located. 5 mg/kg of xylene was detected at a depth of 12 to 14 feet. This may be a laboratory error. No other volatile organics were observed.

Soil Boring No. 3 (B-3) was located directly down gradient from the location of Tank No. 38. There were no volatile organic substances revealed at any depth in B-3.

Soil Boring No. 4 (B-4) was located near the northern edge of the excavated area where the leak occurred. No volatile organic compounds were detected at any depth in B-4.

WATER ANALYSES

The analyses of the groundwater samples which were collected on April 11, 1988, indicate xylene in the upgradient well. The volatile organic analyses do not exceed established Maximum Contamination Levels (MCL). Presence of xylene in the upgradient well may be due to sampling and/or laboratory error. Several metals were detected in the "upgradient" well (See Appendix F.) The wells were resampled on July 26, 1988 and metals were detected again in the "upgradient" well (B-1). The presence of metals in both April and July samples may be due to not filtering samples prior to performing analytical tests. No volatile organics were detected in the July samples.

CORRECTIVE AND REMEDIAL ACTIONS

Based on the current investigation, our opinion is that remedial actions are complete and that the Tank No. 38 Site meets the closure performance standards outlined in 40 CFR 265.111.

APPENDIX A

Letter from Petro Service

MECHANICAL & ELECTRONIC SERVICE FOR THE INDUSTRY

DELTA PETRO SERVICE CO., INC.

740 N. ROCHESTER ROAD • CLAWSON, MICHIGAN 48017
(313) 588-6360

December 9, 1987

Mr. Ernest L. Mecham
Hazardous Waste Coordinator
Plant Environment
General Motors Proving Ground
Milford, Michigan 48042

Re: Petro Tite (Kent-Moore) test results, General Motors Milford Proving Grounds, Milford, Michigan.

Dear Mr. Mecham:

Please be advised that in accordance with your request, on December 3, 1987, the following fuel tanks and their related distribution lines, located at this referenced location, were tested with the Petro Tite (Kent-Moore) system for tightness.

One 3,000 gallon waste gas (Building 42-A)
One 1,500 gallon waste hyd. oil (Building 70)

At the time the testing was concluded, all the systems tested (2), with the exception of the following tank, one 3,000 gallon waste gas (Building 42-A), were found to be tight in accordance with the National Fire Protection criteria for tank tightness. This tank system is indicating a leak, under test conditions, at the rate indicated on the enclosed tank test record sheets.

For your records, I am enclosing copies of all test results. Please be sure to retain these for your files.

If any further information or documentation may be required, please feel free to contact me at your earliest convenience.

Mr. Ernest L. Mecham, General Motors Proving Ground

Very truly yours,

DELTA PETRO SERVICE COMPANY, INC.

Richard Rex Rubin, Sr.
President

RRR:mg

Enclosure

Petro Tite
TANK TESTER

100 TOSCA DRIVE

14. General Motors — Name of Supplier, Owner or Dealer — Address No. and Street(s) — Milford (City) — Michigan (State) — 12-3-82 (Date of Test)

15. TANK TO TEST

Identify by position: Bld 42 A

Brand and Grade: Waste Gas

16. CAPACITY

Nominal Capacity 3000 Gallons

By most accurate capacity chart available 3008 Gallons

From
- X Station Chart
- Tank Manufacturer's Chart
- Company Engineering Data
- Charts supplied with Petro Tite
- Other

Is there doubt as to True Capacity? ☐
See Section "DETERMINING TANK CAPACITY"

17. FILL-UP FOR TEST

Stick Water Bottom before Fill-up 5 to ⅛ in. - 105 Gallons

Fill up. STICK BEFORE AND AFTER EACH COMPARTMENT DROP OR EACH METERED DELIVERY QUANTITY

	Stick Readings to ⅛ in.	Gallons	Total Gallons in Reading
Inventory	Full	Tank	3008
	- water		108
	Top off	5	2900
			2905
Product in full tank (up to fill pipe)			

Tank Diameter 64"

18. SPECIAL CONDITIONS AND PROCEDURES TO TEST THIS TANK

See manual sections applicable. Check below and record procedure in log (26).

☐ Water in tank ☐ High water table in tank excavation ☐ Line(s) being tested with LVLLT

VAPOR RECOVERY SYSTEM
☐ Stage I
☐ Stage II

19. TANK MEASUREMENTS FOR TSTT ASSEMBLY

Bottom of tank to Grade*	104"
Add 30" for 4" L	30"
Add 24" for 3" L or air seal	"
Total tubing to assemble Approximate	134"

20. EXTENSION HOSE SETTING

Tank top to grade* 40"

Extend hose on suction tube 6" or more below tank top "

*If Fill pipe extends above grade, use top of fill.

21. TEMPERATURE/VOLUME FACTOR (a) TO TEST THIS TANK

Is Today Warmer? ☐ Colder? ☐ ___°F Product in Tank ___°F Fill-up Product on Truck ___°F Expected Change ___°F

22. Thermal-Sensor reading after circulation 08371 digits 46/47 °

23. Digits per °F in range of expected change 312 digits

24. 2905 total quantity in full tank (16 or 17) × .00054473 coefficient of expansion for involved product = 1.5823535 volume change in this tank per °F

25. 1.5823535 volume change per °F (24) ÷ 312 Digits per °F in test Range (23) = .0050716 Volume change per digit. Compute to 4 decimal places. ,0051 This is test factor (a)

26. LOG OF TEST PROCEDURES			30. HYDROSTATIC PRESSURE CONTROL		31. VOLUME MEASUREMENTS (V) RECORD TO .001 GAL.			34. TEMPERATURE COMPENSATION USE FACTOR (a)			38. NET VOLUME CHANGES EACH READING	39. ACCUMULATED CHANGE
27. DATE / TIME (24 hr.)	28. Record details of setting up and running test. (Use full length of line if needed.)	29. Reading No.	Standpipe Level in Inches: Beginning of Reading	Level to which Restored	32. Product in Graduate: Before Reading	After Reading	Product Replaced (-) / Product Recovered (+)	35. Thermal Sensor Reading	36. Change Higher + Lower - (c)	37. Computation (c) × (a) = Expansion + Contraction -	Temperature Adjustment; Volume Minus Expansion or Contraction	If high level record Total End Deflection; If low level compute change per hour

A-5

GM Milford Hydrogeo.

[illegible] arrived at job site

Factor A .0051

1105 Pump Primed & Running											
1115 First sensor Reading	1		42				or 371				
1130 Start high level Test	2	40.5	42	.720	.560	-.160	371	±0	±0	-.160	
1145 cont. high level Test	3	41.0	42	.560	.470	-.090	370	-1	-.005	-.085	
1200 '' '' '' ''	4	34	42	.900	.160	-.740	352	-18	-.092	-.648	
1215 '' '' '' ''	5	33.9	42	.860	.130	-.730	344	-8	-.041	-.691	
1230 '' '' '' ''	6	33.9	42	.930	.240	-.690	334	-10	-.051	-.639	
Drop to low level			12				334				
1245 Start low level Test	7	10.8	12	.400	.320	-.080	332	-2	-.010	-.070	
1300 cont. low level Test	8	10.7	12	.320	.230	-.090	329	-3	-.015	-.075	145
1315 '' '' '' ''	9	11.2	12	.790	.720	-.070	329	±0	±0	-.070	215
1330 '' '' '' ''	10	10.9	12	.840	.730	-.110	326	-3	-.015	-.095	300

.310 GPH.

System is not tight

petro tite
TANK TESTER

PLEASE PRINT

OWNER Property ☐ Name ____ Address ____ Representative ____ Telephone ____
Tank(s) ☐ Name ____ Address ____ Representative ____ Telephone ____

2. OPERATOR Name ____ Address ____ Telephone ____

3. REASON FOR TEST (Explain Fully)

4. WHO REQUESTED TEST AND WHEN Name ____ Title ____ Company or Affiliation ____ Date ____ Address ____ Telephone ____

5. WHO IS PAYING FOR THIS TEST? Company, Agency or Individual ____ Person Authorizing ____ Title ____ Telephone ____
Billing Address ____ City ____ State ____ Zip ____
Attention of: ____ Order No. ____ Other Instructions ____

6. TANK(S) INVOLVED

Identify by Direction	Capacity	Brand/Supplier	Grade	Approx. Age	Steel/Fiberglass
AT BLD. H2A	3,000		WASTE GAS	30 YR	STEEL
AT BLD 70	1,500		WASTE OIL	2 YR	STEEL

7. INSTALLATION DATA

Location (North inside driveway, Rear of station, etc.)	Cover (Concrete, Black Top, Earth, etc.)	Fills (Size, Titelill make, Drop tubes, Remote Fills)	Vents (Size, Manifolded)	Siphones (Which tanks?)	Pumps (Suction, Remote, Make if known)
	3,000 EARTH 1500 CONCRETE	3,000 3" 1500 4"	2"	NONE	NO PUMPS

8. UNDERGROUND WATER Depth to the Water table ____" Is the water over the tank? ☐ Yes ☐ No

9. FILL-UP ARRANGEMENTS Tanks to be filled ____ hr. ____ Date ____ Arranged by ____ Name ____ Telephone ____
Extra product to "top off" and run TSTT. How and who to provide? Consider NO Lead.
Terminal or other contact for notice or inquiry ____ Company ____ Name ____ Telephone ____

10. CONTRACTOR, MECHANICS, any other contractor involved

11. OTHER INFORMATION OR REMARKS
TANK AT BLD. H2-A ReTested on 12-4-87
-.2910 G.P.H. on high level Test STOP TEST

Additional information on any items above. Officials or others to be advised when testing is in progress or completed. Visitors or observers present during test etc.

12. TEST RESULTS
Tests were made on the above tank systems in accordance with test procedures prescribed for petro tite as detailed on attached test charts with results as follows:

Tank Identification	Tight	Leakage Indicated	Date Tested
TANK AT BLD H2A	NO	-.310 G.P.H.	12-3-87
TANK AT BLD 70	YES	-.011 G.P.H.	12-3-87
TANK AT BLD H2A	NO	-.2910 G.P.H	12-4-87

13. CERTIFICATION
This is to certify that these tank systems were tested on the date(s) shown. Those indicated as "Tight" meet the criteria established by the National Fire Protection Association Pamphlet 329.

12-3-87
Date
#57
Serial No. of Thermal Sensor

[signature] Technicians

DELTA PETRO SERVICE CO. INC. Company — Richard Rex Kubin By: [signature] Signature
740 NORTH ROCHESTER ROAD
CLAWSON, MICHIGAN 48017 Address
(313) 588-6060

APPENDIX B

Stockpiled Soil Analysis

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett

June 3, 1988

P.O.# PGB00064, Shipper# 29051, Rel.# 005270

PROGRAM: WASTE ANALYSES

Date Received: 4-28-88	
ALD Number:	37253
Client I.D.:	Gas Contaminated Soil 4-25-88
Physical Description:	100% Brown Sand

As Received:

Total Solids @ 104 °C, %	92
Ignitability, °F	>200
Reactive Cyanide, CN, mg/kg	ND
Reactive Sulfide, S_2, mg/kg	ND
Thallium, Tl, mg/kg	ND
Nickel, Ni, mg/kg	3.6
Volatile Organic Analysis:	No Compounds Detected

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.09
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.10
Cyanide, CN, mg/l	ND

ND - None Detected.

Please see attached sheet for additional notes, detection limits, and complete listing of compounds included in the volatile organic analysis.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 143 mls of 0.5 N acetic acid was 5.0.

cc: Ernie Mecham
WA/7r

Burmah

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett

PROGRAM: WASTE ANALYSIS

	Routine Detection Levels
As Received:	
Total Solids, %	NA
Ignitability, °F	NA
Reactive Cyanide, CN, mg/kg	1
Reactive Sulfide, S_2, mg/kg	2
Thallium, Tl, mg/kg	13
Nickel, Ni, mg/kg	0.5
EP Toxicity:	
Arsenic, As, mg/l	0.005
Barium, Ba, mg/l	0.05
Cadmium, Cd, mg/l	0.01
Chromium, Cr, mg/l	0.02
Lead, Pb, mg/l	0.05
Mercury, Hg, mg/l	0.0005
Selenium, Se, mg/l	0.005
Silver, Ag, mg/l	0.02
Copper, Cu, mg/l	0.02
Zinc, Zn, mg/l	0.02
Cyanide, CN, mg/l	0.02

NA - Not Applicable.

WA/8r

Susan K. Scott
Laboratory Supervisor

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

The General Motors Corporation (GMC) has completed the U.S. EPA's questionnaire pursuant to RCRA Section 3004(u) for the Milford Proving Ground. The questionnaire is titled *Certification Regarding Potential Releases from Solid Waste Management Units*. The completed questionnaire is presented in the Facility Specific Information Attachment. Units identified are indicated on the topographic map(s) (Figure(s) 15-1, 15-2, and 15-3) in Attachment 15.0.

CERTIFICATION REGARDING POTENTIAL RELEASES FROM SOLID WASTE MANAGEMENT UNITS

FACILITY NAME: General Motors Proving Ground

EPA I.D. NUMBER: MID 082220757

LOCATION CITY: Milford

STATE: Michigan, 48042

1. Are there any of the following solid waste management units at your facility?

	YES	NO
° Landfill	X	
° Surface Impoundment	X	
° Land Farm	X	
° Waste Pile	X	
° Incinerator	X	
° Storage Tank (Above Ground)	X	
° Storage Tank (Underground)	X	
° Container Storage Area	X	
° Injection Wells		X
° Wastewater Treatment Units	X	
° Transfer Stations		X
° Waste Recycling Operations		X
° Waste Treatment, Detoxification		X
° Other Sludge drying beds	X	
In ground tanks	X	

2. If there are "Yes" answers to any of the items in Number 1 above, please provide a description of the wastes that were stored, treated or disposed of in each unit. In particular, please focus on whether or not the wastes would be considered as hazardous wastes or hazardous constituents under RCRA. Also include any available data on quantities or volume of wastes disposed on and the dates of disposal. Please also provide a description of each unit and include capacity, dimensions, location at facility, provide a site plan if available.

See Attachment I

NOTE: Hazardous waste are those identified in 40 CFR 261. Hazardous constituents are those listed in Appendix VIII Of 40 CFR Part 261.

OMB CONTROL NUMBER: 2050-0059 (06/30/86)

3. For the units noted in Number 1 above, please describe for each unit any data available on any prior or current releases of hazardous wastes or constituents to the environment that may have occurred in the part or still be occurring.

   Please provide the following information:

   a. Date of release
   b. Type of waste released
   c. Quantity or volume of waste released
   d. Describe nature of release (i.e., spill, overflow, ruptured pipe or tank, etc.)

   See Attachment II.

4. In regard to the prior releases described in Number 3 above, please provide (for each unit) any analytical data that may be available which would describe the nature and extent of environmental contamination that exists as a result of such releases. Please focus on concentrations of hazardous wastes or constituents present in contaminated soil or groundwater.

   See Attachment III.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the submittal is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (42 U.S.C. 6902 et seq. and 40 CFR 270.11(d))

Fraser D. Smithson, Director
Typed Name and Title

Signature

5/31/88
Date

OMB CONTROL NUMBER: 2050-0059 (06/30/86)

Attachment 1
Question 2

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
1.	Landfill	Vegetation landfill covering 1/2 acre. Natural hole. Remaining capacity is 5-9 yrs.	Dead trees, prunings, shipping crates. No hazardous waste or constituents.	200 cu.yd. /yr.	1960 - present
2.	Landfill	Inert Material landfill. Covers 1 acre. Natural hole. Remaining capacity 1-2 years.	Broken concrete, brick, masonry, pavement, uncontaminated soil. No hazardous wastes or constituents.	2000 cu. yd. /yr.	1969 - present
3.	Landfill	Closed landfill - covers 7500 sq. ft. Last used in 1973	Only known waste was pesticides	18-20 cu. yd.	1973
4.	Surface Impoundment	Seepage pond - covers 9600 sq. ft. and is 1 ft. deep. Referred to as Outfill 003 under our NPDES Permit. Storm shed.	Non-hazardous waste - water and storm water runoff.	2-3 mgal /yr	1951 - present
5.	Surface Impoundment	Mott "Lake" - covers 8 acres and is 4 ft. deep. Has an inlet and outlet. Storm shed.	Non-hazardous waste - water from Outfall 001 and storm water run-off flow through the the unit into Mann Creek.	62-84 mgal /yr - Known flows from 1978 to present	1924 - present
6.	Surface Impoundment	Pickett "Lake" - covers 500,000 sq. ft. and is 7.5 ft. deep. Storm shed.	Storm water run-off	25-35 mgal /yr.	~~1951 - present~~
7.	Land Farm	15 acre field. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	7 cu. yds. 16.4 cu. yds. 18 cu. yds.	6/26/87 4/12/88 6/16/88

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
8.	Land Farm	4.5 mile strip of land around the Circular Test Track covering about 70 acres. Crop is grass. facing photo 18 S.E.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	9.7 cu. yd. 7 cu. yd. 40 cu. yd. 35 cu. yd.	3/24/87 7/31/87 11/18/87 8/5/88
9.	Land Farm	14 acre field inside the Truck Test Loop. Crop is grass. S.E. corner of truck test loop photo #2 facing North from S.E. corner @ 1.3 mi. marker	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from activated sludge system.	100 cu. yd. /yr.	1978 - 1983
10.	Waste Pile	20425 sq. ft. fenced-in paved storage area south of Bldg 73A PHOTO 2-7 FACING NORTH	Compacted cars which have been drained of fluids, and metal car parts.	N.A.	1976 to presen
11.	Waste Pile	86175 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped cars and metal car parts. full vehicles	N.A.	1966 - 1976 closed site of Bldg # 78
12.	Waste Pile	2080 sq. ft. fenced-in storage area north of Bldg 86. PHOTO 2-8 FACING EAST	Scrapped tires.	N.A.	1986 to presen
13.	Waste Pile	3500 Sq. Ft. Fenced-in storage area south of Bldg 73A. CLOSED PHOTO 2-8 FACING WEST	Scrapped tires.	N.A.	1976 - 1986
14.	Waste Pile	900 sq. ft. fenced-in storage area east of Bldg 31. site covered by Bldg 78	Scrapped tires.	N.A.	1966 - 1976
15.	Waste Pile	150 sq. ft. concrete storage area next to the old Butler Bldg under Water Tower #2	Scrapped lead acid batteries NO LONGER IN USE	N.A.	? to ~~present~~ 1988

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
16.	Incinerator	Located in Bldg 18 closed & removed, building currently used for storage	Rubbish - paper prod. (picture #13 facing S.E.	N.A.	1954 - 1973
17.	Above ground tank	(2) 10 gal capacity stainless steel tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - ~~F001~~ D009 NA F001	N.A.	1981 - present
18.	Above ground tank	30 gal capacity polyethylene tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - D001	N.A.	1981 - present
19.	Underground tank	Tank #93 - 11,730 gal. capactiy fiberglass tank at Bldg 43. 90 day accumulation.	Hazardous waste - D001, gasoline no longer in use still in place, filled with water & anti-freeze, no integrity test data	N.A.	1985 - 1987
20.	Underground tank	Tank #38 - 3,000 gal. capacity steel tank at Bldg 42A. 90 day accumulation. (removed 12/10/87) photo 14, S.E.	Hazardous waste - D001, gasoline adjacent to Bldg 42-A, leak, 3 monitoring wells 12-18 yards removed, report being finalized will be sent to U.S. EPA, G.W. data => non detectable	N.A.	1987
21.	Underground tank	Tank #122A - 4,000 gal. capacity steel tank at Bldg 12. 90 day accumulation. (removed 1988) North side of Bldg 12	Hazardous waste - engine oil, contaminated with F001 removed, single wall steel tank removed no visible contamination, no soil sampling	N.A.	1974 - 1988
22.	Underground tank	Tank #123 - 1,000 gal. capacity steel tank at Bldg 26. 90 day accumulation. (removed 1987)	Hazardous waste - engine oil, contaminated with F001 REMOVED, NO VISIBLE SOIL CONTAMINATION NO SOIL TESTING EAST SIDE OF BLDG 26	N.A.	1966 - 1987
23.	Underground tank	Tank #124 - 1,000 gal. capacity steel tank at Bldg 27. 90 day accumulation. (Abandoned 1987)	Hazardous waste - engine oil, contaminated with F001 FILLED WITH WATER/ANTIFREEZE SITE CURRENTLY SITE OF A TEMP. TRAILER	N.A.	1967 - 1987
24.	Underground tank	Tank #125 - 1,000 gal. capacity steel tank at Bldg 32. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001 SITE OF TEMP. TRAILER, NO VISIBLE CONTAMINATION, NO SOIL TESTING	N.A.	1972 - 1987

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
25.	Underground tank	Tank #127 - 6,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
26.	Underground tank	Tank #127A - 10,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
27.	Underground tank	Tank #133 - 500 gal. capacity steel tank at Bldg 31. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1978 - 1987
28.	Underground tank	Tank #137 - 1,500 gal. capacity steel tank at Bldg 70. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1981 to present
29.	Underground tank	Tank #138 - 4,000 gal. capacity steel tank at Bldg 78. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1985 to present
30.	Underground tank	Tank #136 - 1,500 gal. capacity steel tank at Bldg 24.	Non-hazardous waste - hydraulic oil	N.A.	1981 to present
31.	Underground tank	Tank #226 - 15,000 gal. double walled steel/polyethylene tank. 90 day accumulation.	Hazardous waste - gasoline and petroleum distillates.	N.A.	1/88 to presen
32.	Underground tank	Tank #227 - 15,000 gal. double walled steel/polyethylene tank. 90 day accumulation.	Hazardous waste - oil contaminated with F001	N.A.	1/88 to presen
33.	Underground tank	Tank #145 - 4,000 gal. fiberglass tank. (removed in 1982)	Hazardous waste - chlorinated solvents, paint & thinners; mineral spirits.	N.A.	1974 - 1980

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
34.	Underground tank	Tank # 150 - 12,000 gal. steel tank.	Non-Hazardous process water.	N.A.	1981 to present
35.	Container storage area	6 ft. x 25 ft. covered concrete area for storage of approximately 20 (55) gallon drums of waste. Containment provided.	Hazardous waste - chlorinated solvents, paints, paint thinners, mineral spirits, paint solids, adhesives.	N.A.	1974 - 1980
36.	Container storage area	a 4 ft. x 6 ft. pallet in a 10 ft. x 14 ft. masonry building (Bldg 39) used for storage.	Hazardous waste - depleted lithium batteries (D003), waste.	N.A.	1982 to present
37.	Container Storage area	A 10 ft. x 10 ft. curbed-in concrete storage area in Reynolds Barn. 270 day accumulation.	PCB contaminated hydraulic oil, rags & gloves; capacitors & lighting ballasts.	N.A.	1981 to present
38.	Container storage area	A 10,000 sq. ft. paved area located by the barrel storage area.	Empty barrels once filled with hazardous or non-hazardous materials.	N.A.	1974 to present
39.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1974 to present
40.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1983 to present

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
41.	Wastewater Treatment Unit	Imhoff tank closed, open septic tank photo #10 facing east	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water.	N.A.	? - 1974
42.	Other - in ground tank	Concrete storage or surge tank for the wastewater treatment units having the capacity of 160,000 gal.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A. photo #9 facing South	1974 to present
43.	Other - in ground tank	Concrete accumulation tank at Bldg 31. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1978 to present photo #1
44.	Other - in ground tank	Concrete accumulation tank at Bldg 70. Has the capacity of 10,500 gal. Used as a lift station. same as 43 (photo #1)	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1981 to present
45.	Other - in ground tank	Concrete accumulation tank at Bldg 40. Has the capacity of 10,500 gal. Used as a lift station. same as 43 (photo #1)	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1970

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
46.	Other - sludge drying beds	Two side-by-side concrete units covering 12,000 sq. ft. & having a total capacity of 64,000 gal. Seepage collection system. Seepage pumped into wastewater storage tank.	Non-hazardous sludge from aerobic digester of wastewater treatment unit.	N.A.	1986 to present
47.	Other - sludge drying beds	12,000 sq. ft. graveled area. closed, present site of #6 photo #1	Non-hazardous sludge from aerobic digester of wastewater treatment unit.	N.A.	1974 - 1986

⇒ photo 12 facing S.W.

#48 Lead/Acid Battery Storage North of Bldg 11 ≈20'X30 concrete wall/sheet metal metal roof on 3 side 1988-Present
photo 3-4 facing NORTH
also hazardous waste material drop off 1-3 days

MID 082220757

ATTACHMENT II

QUESTION 3

SITE NUMBER & DESCRIPTION	DATE OF RELEASE	TYPE OF WASTE RELEASED	QUANTITY RELEASED	DESCRIPTION OF RELEASE
Site #20 - underground tank #38.	12/04/87 date detected	Petroleum distillates	Quantity unknown, believed to be small. Investigation on-going.	Leak from tank piping system at the tank site.
3 monitoring wells				
Site #38 ~~33~~ - underground tank #145.	Nov. 1982 date detected	Chlorenated solvents, paint and paint thinners, mineral spirits.	Quantity unknown, believed to be small.	Leak from a small hole in bottom of tank.
visible soil contamination, 2-3 drums of contaminated soil removed				
no G.W. wells or data				

ATTACHMENT III, QUESTION 4. SITE #33, TANK #145. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48058
313 334-1630
313 334-4747

12-1-82

GM Proving Grounds

Milford, MI 48042
Attn: Ms. Carole Everett

P.O. # PGM 679584

Rel # 42546

Sample received: 11-29-82

Hydro Number: 59802

Client I.D. Contaminated Dirt

Flash Point °F. 83

Density, g/ml 1.81

Linda Deans/ss

Linda Deans
General Laboratory Manager

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38 MID 0082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received:	12-17-87
ALD Number:	31657
Client I.D.:	Gas contaminated soil 12-15-87
Physical Description:	100% Brown soil

As Received:

Total Solids @ 104°C, %	84
Ignitability, °F	>200
Reactive Cyanide, CN, mg/kg	<1
Reactive Sulfide, S_2, mg/kg	<2
Thallium, Tl, mg/kg	22
Nickel, Ni, mg/kg	6.7

EP Toxicity:

Arsenic, As, mg/l	<0.005
Barium, Ba, mg/l	0.13
Cadmium, Cd, mg/l	<0.01
Chromium, Cr, mg/l	<0.02
Lead, Pb, mg/l	<0.05
Mercury, Hg, mg/l	<0.0005
Selenium, Se, mg/l	<0.005
Silver, Ag, mg/l	<0.02
Copper, Cu, mg/l	<0.02
Zinc, Zn, mg/l	0.06
Cyanide, CN, mg/l	<0.02

cc: Ernie Mecham

Susan K. Scott
Laboratory Supervisor

WA/lr

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received:	12-17-87
ALD Number:	31657
Client I.D.:	Gas contaminated soil 12-15-87
Physical Description:	100% Brown soil

Volatile Organic Analysis:

Petroleum Distillates, mg/kg	250-300

Please note that this additional volatile analysis was requested and performed one month after sample was originally received and analyzed.

Please see attached sheet for additional notes, detection limits, and complete listing of compounds included in the volatile organic analysis.

WA/2r

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF THE EXCAVATED SOIL.

Burmah

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett

March 4, 1988

PROGRAM: WASTE ANALYSIS

Date Received: 12-17-87

ALD Number: 31657

Client I.D.: Gas contaminated soil
12-15-87

Halogenated, mg/kg:

Bromodichloromethane	<2
Bromoform	<10
Bromomethane	<5
Carbon Tetrachloride	<2
Chlorobenzene	<2
Chloroethane	<2
2-Chloroethylvinyl ether	<5
Chloroform	<2
Chloromethane	<5
Dibromochloromethane	<5
1,2-Dichlorobenzene	<10
1,3-Dichlorobenzene	<10
1,4-Dichlorobenzene	<10
Dichlorodifluoromethane	<2
1,1-Dichloroethane	<2
1,2-Dichloroethane	<2
1,1-Dichloroethene	<2
Trans-1,2-Dichloroethene	<2
1,2-Dichloropropane	<2
Cis-1,3-Dichloropropene	<2
Trans-1,3-Dichloropropene	<2
Methylene Chloride	<2
1,1,2,2-Tetrachloroethane	<2
Tetrachloroethene	<2
1,1,1-Trichloroethane	<2
1,1,2-Trichloroethane	<2
Trichloroethene	<2
Trichlorofluoromethane	<2
Vinyl Chloride	<5

Aromatic, mg/kg:

Benzene	<2
Ethyl Benzene	<2
Toluene	<2
Xylenes	<2

EPA Method 601 & 602

WA/3c

Burmah

VOLATILE ORGANIC ANALYSIS BY GAS CHROMATOGRAPHY

These compounds were included in the volatile organic analysis. Unless noted in the body of the report, they were not detected. The method detection level is 10 mg/kg.

Bromodichloromethane
Bromoform
Bromomethane
Carbon Tetrachloride
Chlorobenzene
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Chloromethane
Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
Dichlorodifluoromethane

1,1 Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
trans-1,2-Dichloroethene
1,2-Dichloropropane
cis-1,3-Dichloropropene
trans-1,3-Dichloropropene
Methylene Chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethane
Trichlorofluoromethane
Vinyl Chloride

Benzene
Ethyl Benzene
Toluene
Xylenes
Styrene
Acetone
MEK
MIBK
Petroleum Distillates

WA/4r

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID082220757
ANALYSIS MONITORING WELL WATER SAMPLES.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G. M. Proving Ground
Milford, MI 48042-2002
Attn: Carol Everett, 23 - Plant Engineering

July 21, 1988

Follow-up Report

PROGRAM: GROUNDWATERS - UST

Date Received: 4-11-88

ALD Number:	36349	36350	36351
Client I.D.:	B-1 4-11-88	B-2 4-11-88	B-3 4-11-88
Volatile Organic Analysis:			
Chlorobenzene, ug/l	ND	ND	ND
1,2-Dichlorobenzene, ug/l	ND	ND	ND
1,3-Dichlorobenzene, ug/l	ND	ND	ND
1,4-Dichlorobenzene, ug/l	ND	ND	ND
Benzene, ug/l	ND	ND	ND
Ethyl Benzene, ug/l	ND	ND	ND
Toluene, ug/l	ND	34	ND
Xylenes, ug/l	220	3	ND
Styrene, ug/l	ND	ND	ND
Arsenic, As, mg/l	0.47	0.55	0.13
Barium, Ba, mg/l	1.0	4.7	1.2
Cadmium, Cd, mg/l	0.03	0.04	ND
Chromium, Cr, mg/l	0.23	0.33	0.06
Lead, Pb, mg/l	0.72	0.45	0.08
Mercury, Hg, mg/l	0.0016	0.0010	ND
Selenium, Se, mg/l	0.14	ND	ND
Silver, Ag, mg/l	ND	ND	ND
Copper, Cu, mg/l	1.1	0.51	0.11
Zinc, Zn, mg/l	2.8	2.9	0.61

ND - None Detected.

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

Original Report: 5-11-88

H2O/1L

Susan K. Scott
Laboratory Supervisor

Burmah

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID082220757
ANALYSIS MONITORING WELL WATER SAMPLES.

General Motors Corporation
G. M. Proving Ground
Attn: Carol Everett, 23 - Plant Engineering

July 21, 1988

PROGRAM: GROUNDWATERS - UST

	Routine Detection Limits	Methodology
Volatile Organic Analysis:		
Chlorobenzene, ug/l	2	8020
1,2-Dichlorobenzene, ug/l	10	8020
1,3-Dichlorobenzene, ug/l	10	8020
1,4-Dichlorobenzene, ug/l	10	8020
Benzene, ug/l	2	8020
Ethyl Benzene, ug/l	2	8020
Toluene, ug/l	2	8020
Xylenes, ug/l	2	8020
Styrene, ug/l	2	8020
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

H2O/2L

ATTACHMENT III. QUESTION 4. SITE #20. TANK #38. MID082220757
ANALYSIS MONITORING WELL WATER SAMPLES.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G. M. Proving Ground
Milford, MI 48042-2002
Attn: Carol Everett, 23 - Plant Engineering

August 19, 1988

P.O. #PGB00382, Rel. #006327

PROGRAM: GROUNDWATERS - UST (Resamples)

Date Received: 7-26-88

ALD Number:	41693	41694	41695
Client I.D.:	B-1 7-26-88	B-2 7-26-88	B-3 7-26-88
Volatile Organic Analysis:			
Chlorobenzene, ug/l	ND	ND	ND
1,2-Dichlorobenzene, ug/l	ND	ND	ND
1,3-Dichlorobenzene, ug/l	ND	ND	ND
1,4-Dichlorobenzene, ug/l	ND	ND	ND
Benzene, ug/l	ND	ND	ND
Ethyl Benzene, ug/l	ND	ND	ND
Toluene, ug/l	ND	ND	ND
Xylenes, ug/l	ND	ND	ND
Styrene, ug/l	ND	ND	ND
Arsenic, As, mg/l	0.28	0.26	0.12
Barium, Ba, mg/l	0.53	2.4	0.54
Cadmium, Cd, mg/l	0.12	0.25	0.02
Chromium, Cr, mg/l	0.18	0.20	0.04
Lead, Pb, mg/l	0.24	0.11	ND
Mercury, Hg, mg/l	ND	ND	ND
Selenium, Se, mg/l	0.073	ND	ND
Silver, Ag, mg/l	ND	ND	ND
Copper, Cu, mg/l	0.55	0.28	0.05
Zinc, Zn, mg/l	1.4	1.5	0.29

ND - None Detected.

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

H2O/1K

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID082220757
ANALYSIS MONITORING WELL WATER SAMPLES.

Burmah

General Motors Corporation
G. M. Proving Ground
Attn: Carol Everett, 23 - Plant Engineering

August 19, 1988

PROGRAM: GROUNDWATERS - UST (Resamples)

	Routine Detection Limits	Methodology
Volatile Organic Analysis:		
Chlorobenzene, ug/l	2	8020
1,2-Dichlorobenzene, ug/l	10	8020
1,3-Dichlorobenzene, ug/l	10	8020
1,4-Dichlorobenzene, ug/l	10	8020
Benzene, ug/l	2	8020
Ethyl Benzene, ug/l	2	8020
Toluene, ug/l	2	8020
Xylenes, ug/l	2	8020
Styrene, ug/l	2	8020
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

H20/2L

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID082220757
ANALYSIS MONITORING WELL WATER SAMPLES.

Burmah

G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

August 19, 1988

PROGRAM: GROUNDWATERS - UST (Resamples)

FIELD NOTES

Initial Objectives:

Obtain static water measurements, evacuate 3 times the standing water volume and obtain a representative water sample from 3 wells.

Work Completed:

Date Completed: July 26, 1988
Weather: Clear, 70's

Static water levels were obtained. Wells were evacuated and sampled immediately. See Table I.

Equipment & Methods:

Static water measurements were obtained using a Q.E.D. Well Wizard Model 6000 Water Level Indicator, evacuations were performed using a teflon bailer with polypropylene rope. A new section of rope was used at each well. All equipment was thoroughly rinsed between each well. Work was performed by Burmah Technical Services personnel B. Thomas and C. Gauthier.

TABLE I

Well Number	Well Type	Static Water Level (ft)	Bottom Depth (ft)	Quantity Evacuated
B-1	2" Tef.	11.00	20.0	4.32 Gal.
B-2	2" Tef.	10.90	20.0	4.38 Gal.
B-3	2" Tef.	10.60	20.0	4.50 Gal.

H2O/3k

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

Follow-Up Report

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36405
Client I.D.:	Boring 1 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	87
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.05

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 211 mls of 0.5 N acetic acid was 5.1.

cc: Ernie Mecham, 23 - Plant Engineering
Bill Kotowski - McNamee, Porter & Seeley

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36406
Client I.D.:	Boring 1 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	91
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 77 mls of 0.5 N acetic acid was 5.2.

WA/2r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36407
Client I.D.:	Boring 1 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	86
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.08
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.05

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 127 mls of 0.5 N acetic acid was 5.2.

WA/3r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36408
Client I.D.:	Boring 1 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	99
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 18 mls of 0.5 N acetic acid was 5.2.

WA/4r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36409
Client I.D.:	Boring 2 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	89
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 49 mls of 0.5 N acetic acid was 5.0.

WA/5r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36410
Client I.D.:	Boring 2 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	5
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 103 mls of 0.5 N acetic acid was 5.2.

WA/6r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36411
Client I.D.:	Boring 2 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	87
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.02

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 35 mls of 0.5 N acetic acid was 5.2.

WA/7r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 08222757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36412
Client I.D.:	Boring 2 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	84
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 238 mls of 0.5 N acetic acid was 5.0.

WA/8r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36413
Client I.D.:	Boring 3 10'-12'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	90
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.19
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 360 mls of 0.5 N acetic acid was 5.2.

WA/9r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36414
Client I.D.:	Boring 3 12'-14'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	94
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.10
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected..

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 190 mls of 0.5 N acetic acid was 5.2.

WA/10r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III. QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36415
Client I.D.:	Boring 3 19'-21'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	82
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.08
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 154 mls of 0.5 N acetic acid was 5.0.

WA/11r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36416
Client I.D.:	Boring 3 21'-23'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.05
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 51 mls of 0.5 N acetic acid was 5.2.

WA/12r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36417
Client I.D.:	Boring 4 9'-11'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.17
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.37

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 400 mls of 0.5 N acetic acid was 5.2.

WA/13r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36418
Client I.D.:	Boring 4 11'-13'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	92
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.05
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.03

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 86 mls of 0.5 N acetic acid was 5.1.

WA/14r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received: 4-11-88	
ALD Number:	36419
Client I.D.:	Boring 4 18'-20'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	83
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	0.06
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	0.04

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 220 mls of 0.5 N acetic acid was 5.1.

WA/15r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

Date Received:	4-11-88
ALD Number:	36420
Client I.D.:	Boring 4 20'-22'
Physical Description:	100% Brown Soil

As Received:

Total Solids @ 104 °C, %	88
Volatile Organic Analysis:	
Chlorobenzene, mg/kg	ND
1,2-Dichlorobenzene, mg/kg	ND
1,3-Dichlorobenzene, mg/kg	ND
1,4-Dichlorobenzene, mg/kg	ND
Benzene, mg/kg	ND
Ethyl Benzene, mg/kg	ND
Toluene, mg/kg	ND
Xylenes, mg/kg	ND
Styrene, mg/kg	ND

EP Toxicity:

Arsenic, As, mg/l	ND
Barium, Ba, mg/l	ND
Cadmium, Cd, mg/l	ND
Chromium, Cr, mg/l	ND
Lead, Pb, mg/l	ND
Mercury, Hg, mg/l	ND
Selenium, Se, mg/l	ND
Silver, Ag, mg/l	ND
Copper, Cu, mg/l	ND
Zinc, Zn, mg/l	ND

ND - None Detected.

100 grams of sample was leached into 1600 mls of deionized water and brought to a final volume of 2000 mls. Final pH after the addition of 16 mls of 0.5 N acetic acid was 5.1.

WA/16r

Susan K. Scott
Laboratory Supervisor

ATTACHMENT III, QUESTION 4. SITE #20, TANK #38. MID 082220757
ANALYSIS OF SOIL BORINGS.

Burmah
Burmah Technical Services, Inc.
Analytical Laboratories Division
408 Auburn Avenue
Pontiac, Michigan 48058
313-334-4747

General Motors Corporation
G.M. Proving Ground
Milford, MI 48042-2002
Attn: Carole Everett, 23 Plt. Eng.

July 21, 1988

PROGRAM: SOIL ANALYSES - UST

	Detection Limits	Methodology
As Received:		
Total Solids @ 104 °C, %	--	1310
Volatile Organic Analysis: (Method 8020), mg/kg	2	8020
EP Toxicity:		
Arsenic, As, mg/l	0.005	7061
Barium, Ba, mg/l	0.05	6010
Cadmium, Cd, mg/l	0.01	6010
Chromium, Cr, mg/l	0.02	6010
Lead, Pb, mg/l	0.05	6010
Mercury, Hg, mg/l	0.0005	7471
Selenium, Se, mg/l	0.005	7741
Silver, Ag, mg/l	0.02	6010
Copper, Cu, mg/l	0.02	6010
Zinc, Zn, mg/l	0.02	6010

EPA SW 846, "Test Methods for Evaluating Solid Wastes."

WA/17r

Susan K. Scott
Laboratory Supervisor

MID082220757

Attachment 1
Question 2

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
1.	Landfill	Vegetation landfill covering 1/2 acre. Natural hole. Remaining capacity is 5-9 yrs.	Dead trees, prunings, shipping crates. No hazardous waste or constituents.	200 cu.yd. /yr.	1960 - present
2.	Landfill	Inert Material landfill. Covers 1 acre. Natural hole. Remaining capacity 1-2 years.	Broken concrete, brick, masonry, pavement, uncontaminated soil. No hazardous wastes or constituents.	2000 cu. yd. /yr.	1969 - present
3.	Landfill	Closed landfill - covers 7500 sq. ft. Last used in 1973.	Only known waste was pesticides.	18-20 cu. yd.	? - 1973
4.	Surface Impoundment	Seepage pond - covers 9600 sq. ft. and is 1 ft. deep. Referred to as Outfall 003 under our NPDES Permit. Storm watershed.	Non-hazardous waste - wastewater and storm water runoff.	2-3 mgal /yr	1951 - present
5.	Surface Impoundment	Mott "Lake" - covers 8 acres and is 4 ft. deep. Has an inlet and outlet. Storm watershed.	Non-hazardous waste - wastewater from Outfall 001 and storm water run-off flow through the the unit into Mann Creek.	62-84 mgal /yr - Known flows from 1978 to present	1924 - present
6.	Surface Impoundment	Pickett "Lake" - covers 500,000 sq. ft. and is 7.5 ft. deep. Storm watershed.	Storm water run-off.	25-35 mgal /yr.	1951 - present
7.	Land Farm	15 acre field located by the northwest end of the Military Straightaway. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	7 cu. yds. 16.4 cu. yds. 18 cu. yds.	6/26/87 4/12/88 6/16/88

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
8.	Land Farm	4.5 mile strip of land around the Circular Test Track covering about 70 acres. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	9.7 cu. yd. 7 cu. yd. 40 cu. yd. 35 cu. yd.	3/24/87 7/31/87 11/18/87 8/5/88
9.	Land Farm	14 acre field inside the Truck Test Loop. Crop is grass.	Non-hazardous wastewater treatment plant sludge which has been dried in sludge drying beds. Generated from an aerobic digester of an activated sludge system.	100 cu. yd. /yr.	1978 - 1983
10.	Waste Pile	20425 sq. ft. fenced-in storage area south of Bldg 73A.	Compacted cars which have been drained of fluids, and metal car parts.	N.A.	1976 to present
11.	Waste Pile	86175 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped cars and metal car parts.	N.A.	1966 - 1976
12.	Waste Pile	2080 sq. ft. fenced-in storage area north of Bldg 86.	Scrapped tires.	N.A.	1986 to present
13.	Waste Pile	3500 Sq. Ft. Fenced-in storage area south of Bldg 73A.	Scrapped tires.	N.A.	1976 - 1986
14.	Waste Pile	900 sq. ft. fenced-in storage area east of Bldg 31.	Scrapped tires.	N.A.	1966 - 1976
15.	Waste Pile	150 sq. ft. concrete storage area next to the old Butler Bldg under Water Tower #2	Scrapped lead acid batteries	N.A.	1960 - 1988

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
16.	Incinerator	Located in Bldg 18	Rubbish - paper prod.	N.A.	1954 - 1973
17.	Above ground tank	(2) 10 gal capacity stainless steel tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - F001	N.A.	1981 - present
18.	Above ground tank	30 gal capacity polyethylene tank with containment located in Bldg 40 - 90 day accumulation	Hazardous waste - D002	N.A.	1981 - present
19.	Underground tank	Tank #93 - 11,730 gal. capacity fiberglass tank at Bldg 43. 90 day accumulation. (abandoned 1988)	Hazardous waste - D001, gasoline	N.A.	1985 - 1987
20.	Underground tank	Tank #38 - 3,000 gal. capacity steel tank at Bldg 42A. 90 day accumulation. (removed 12/10/87)	Hazardous waste - D001, gasoline	N.A.	1987
21.	Underground tank	Tank #122A - 4,000 gal. capacity steel tank at Bldg 12. 90 day accumulation. (removed 1988)	Hazardous waste - engine oil, contaminated with F001	N.A.	1974 - 1988
22.	Underground tank	Tank #123 - 1,000 gal. capacity steel tank at Bldg 26. 90 day accumulation. (removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1966 - 1987
23.	Underground tank	Tank #124 - 1,000 gal. capacity steel tank at Bldg 27. 90 day accumulation. (Abandoned 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1967 - 1987
24.	Underground tank	Tank #125 - 1,000 gal. capacity steel tank at Bldg 32. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1972 - 1987

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
25.	Underground tank	Tank #127 - 6,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
26.	Underground tank	Tank #127A - 10,000 gal. capacity steel tank at Red Barn. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1971 - 1987
27.	Underground tank	Tank #133 - 500 gal. capacity steel tank at Bldg 31. 90 day accumulation. (Removed 1987)	Hazardous waste - engine oil, contaminated with F001	N.A.	1978 - 1987
28.	Underground tank	Tank #137 - 1,500 gal. capacity steel tank at Bldg 70. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1981 to present
29.	Underground tank	Tank #138 - 4,000 gal. capacity steel tank at Bldg 78. 90 day accumulation.	Hazardous waste - engine oil, contaminated with F001	N.A.	1985 to present
30.	Underground tank	Tank #136 - 1,500 gal. capacity steel tank at Bldg 24.	Non-hazardous waste - hydraulic oil	N.A.	1981 to present
31.	Underground tank	Tank #226 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - gasoline and petroleum distillates, D001.	N.A.	1/88 to present
32.	Underground tank	Tank #227 - 15,000 gal. double walled steel/poly-ethylene tank. 90 day accumulation. Located west of Bldg 12.	Hazardous waste - oil contaminated with F001	N.A.	1/88 to present
33.	Underground tank	Tank #145 - 4,000 gal. fiberglass tank at Bldg 42D. (removed in 1982)	Hazardous waste - chlorinated solvents, paint & thinners, mineral spirits. F001, F003, F005, D001.	N.A.	1974 - 1980

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
34.	Underground tank	Tank # 150 - 12,000 gal. steel tank at Bldg 42A.	Non-Hazardous process water.	N.A.	1981 to present
35.	Container storage area	6 ft. x 25 ft. covered concrete area for storage of approximately 20 (55) gallon drums of waste located at Bldg 19. Containment provided.	Hazardous waste - chlorinated solvents, paints, paint thinners, mineral spirits, paint solids, adhesives.	N.A.	1981 to present
36.	Container storage area	a 4 ft. x 6 ft. pallet in a 10 ft. x 14 ft. masonry building (Bldg 39) used for storage.	Hazardous waste - depleted lithium batteries (D003), waste.	N.A.	1982 to present
37.	Container Storage area	A 10 ft. x 10 ft. curbed-in concrete storage area in Reynolds Barn. 270 day accumulation.	PCB contaminated hydraulic oil, rags & gloves; capacitors & lighting ballasts.	N.A.	1981 to present
38.	Container storage area	A 10,000 sq. ft. paved area located by the barrel storage area north of Bldg 11.	Empty barrels once filled with hazardous or non-hazardous materials.	N.A.	1974 to present
39.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1974 to present
40.	Wastewater Treatment Unit	Packaged plant, activated sludge system, steel unit, composed of an aeration/reaeration section, clarifer, chlorination chamber, & an aerobic digester covering 1089 sq. ft. with total capacity of 134,375 gal. located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water, and non-contact cooling water.	N.A.	1983 to present

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
41.	Wastewater Treatment Unit	Imhoff tank located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water.	N.A.	1943 - 1974
42.	Other - in ground tank	Concrete storage or surge tank for the wastewater treatment units having the capacity of 160,000 gal located by Bldg 19.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1974 to present
43.	Other - in ground tank	Concrete accumulation tank at Bldg 31. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1978 to present
44.	Other - in ground tank	Concrete accumulation tank at Bldg 70. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1981 to present
45.	Other - in ground tank	Concrete accumulation tank at Bldg 40. Has the capacity of 10,500 gal. Used as a lift station.	Non-hazardous mixture of sanitary sewage, process water & non-contact cooling water. Small quantities of hazardous waste acids & bases are part of process water.	N.A.	1970 to present

Site No.	SWMU Type	SWMU Description	Waste Description	Amt. Disposed in SWMU	Period of Activity/ Disposal Dates
46.	Other - sludge drying beds	Two side-by-side concrete units covering 12,000 sq. ft. & having a total capacity of 64,000 gal located by Bldg 19. Equipped with a seepage collection system. Seepage pumped into wastewater storage tank.	Non-hazardous sludge from aerobic digester of wastewater treatment units.	N.A.	1986 to present
47.	Other - sludge drying beds	12,000 sq. ft. graveled area located by Bldg 19.	Non-hazardous sludge from aerobic digester of wastewater treatment unit.	N.A.	1974 - 1986
48.	Container storage area	29 ft x 20 ft paved area covered by a 3 sided building structure north of Bldg 11.	Non-hazardous waste - Scrapped lead-acid batteries. Unit also serves as a drop-off area for waste chemical materials generated on site.	N.A.	Sept. 1988 to present

Attachment II

Question 3

SITE NUMBER & DESCRIPTION	DATE OF RELEASE	TYPE OF WASTE RELEASED	QUANTITY RELEASED	DESCRIPTION OF RELEASE
Site #20 - underground tank #38.	12/04/87 date detected	Petroleum distillates	Quantity unknown, believed to be small. Investigation on-going.	Leak from tank piping system at the tank site.
Site #33 - underground tank #145.	Nov. 1982 date detected	Chlorinated solvents, paint & paint thinners, mineral spirits.	Quantity unknown, believed to be small.	Leak from a small hole in bottom of tank.